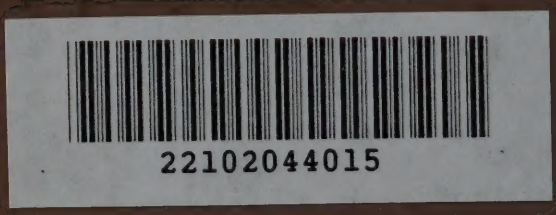
THE STRAIT OF MAGELLAN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NOTES ON

THE NATURAL HISTORY OF THE

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MOUNT BURNEY FROM THE OTTER ISLANDS.

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NOTES ON
THE NATURAL HISTORY
OF THE
STRAIT OF MAGELLAN
AND WEST COAST OF PATAGONIA

MADE DURING THE VOYAGE OF H.M.S. 'NASSAU'
IN THE YEARS 1866, 67, 68, & 69

BY

ROBERT O. CUNNINGHAM,
M.D., F.L.S., ETC.
NATURALIST TO THE EXPEDITION

WITH MAP AND ILLUSTRATIONS

EDINBURGH
EDMONSTON AND DOUGLAS
1871

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TO

JOSEPH DALTON HOOKER,

C.B., M.D., D.C.L., LL.D., F.R.S., ETC.

DIRECTOR OF THE ROYAL GARDENS, KEW,

THIS VOLUME

IS MOST GRATEFULLY DEDICATED

BY THE AUTHOR.

PREFACE.

In the following pages I have sought to record such of my Natural History observations, made in the course of a three-years' cruise, as I judged most likely to prove of interest to general readers as well as to professed naturalists. For fuller details on the Zoology and Botany of the regions visited by me, I must refer the latter to papers which have been, or which will shortly be, contributed to various scientific journals and societies. Lists of the Birds obtained in the Strait of Magellan and on the West Coast of Patagonia, from the pen of our two highest authorities on South American ornithology, Messrs. Sclater and Salvin, have already appeared in the volumes of the *Ibis* for 1868, 1869, and 1870, which likewise contain several letters by myself on the same subject; and I am at present engaged in drawing up some notes on the anatomy of that remarkable bird, the Steamer-duck (*Micropterus cinereus*). An article on the Reptiles, Amphibia, Fishes, Mollusca, and Crustacea, procured during the expedition, will be found in a forthcoming part of the *Linnean Transactions*, and I do not despair, in course of time, to undertake the remaining Invertebrata. I hope also, before many months elapse, to institute a careful examination of my collections of plants now in the Royal Herbarium, Kew, and to draw up a report on the same.

It remains for me to make my acknowledgments to the numerous individuals to whom I have been more or less indebted in various ways during my sojourn abroad, and since my return to this country. First of all, I have to express my heartfelt obligations to Captain Richard Charles Mayne, C.B., R.N., for his unwearied kindness and consideration towards me throughout the period in which I served under his command, as well as for the loan of his private journals, and other generous acts. My obligations are hardly less due to my late messmates, the officers of the "Nassau,"* in whose company I spent three very happy years, and who assisted me most materially in the prosecution of my work. To one and all of them I beg to return my most hearty thanks. To the artistic skill of two of their number (Mr. F. Le B. Bedwell, and the Hon. F. C. P. Vereker) I owe the landscape sketches which adorn this volume; while to the exertions of a third, Dr. S. Campbell, my companion in nearly all my rambles, and an invaluable coadjutor, I am indebted for the greater portion of the ornithological collections obtained. References to services of other members of our party will be met with in the course of this narrative.

My best thanks are also due to the Hydrographer to the Admiralty, Rear-Admiral G. H. Richards, and to Dr. Hooker (to whose kindness I owe more than I can here express), as well as to Professors Huxley, Newton, and Flower; Dr. P.

* Lieutenants D. G. Tandy and J. H. Orlebar; Navigating Lieutenants F. J. Gray and J. T. Hoskyn; Dr. S. Campbell; Messrs. Bedwell and Baverstock; Navigating Sub-Lieutenants E. R. Connor and J. W. Dixon; Mr. H. J. Ollard; and the Hon. F. C. P. Vereker.

L. Sclater and Mr. Salvin; Dr. Gray, Dr. Günther, Dr. Baird, and other gentlemen connected with the British Museum; Mr. E. F. Ffrench of Coquimbo (Chili), and many others at home and abroad. I have in addition to thank Messrs. Waterston & Son of Edinburgh, for the careful manner in which they have lithographed the sketches which were entrusted to them, and Messrs. W. & A. K. Johnston for the exactness with which they have rendered the Natural History illustrations, which were drawn by myself, and which may, I hope, assist in giving the reader a clear idea of some of the characteristic forms of animal and vegetable life in the Strait of Magellan and elsewhere. The name of Dr. Keith Johnston is a sufficient guarantee for the accuracy of the chart of Patagonia and the Strait of Magellan.

ROBERT O. CUNNINGHAM.

The F. C. Manse, Prestonpans, N.B.,
February 20, 1871.

Chart of
PATAGONIA
Gulf of
San Matias
Chiloe I.
Osorno
Quellaype
Minchinmadiva
Corcovado
Yanteles
Huafo I.
Guaytecas Grande
Guaytecas
Is.
Melimoya
Port Nevada
Chonos
Archipelago
Darwin Channel
Port Lagana
Gulf of Peñas
C. Tres Montes
Wellington I.
Madre
Is.
Manover
I.
Puerto Bueno
Strait of Magalhaens
C. Pillar
Queen Adelaide Archo
King William IV Land
I. of Desolation
Brunswick Penin.
Sta Ines I.
Dawson I.
Clarence I.
Tierra
del Fuego
Enlarged Chart of the
STRAIT OF MAGALHAENS
PATAGONIA
C. Fairweather
Port Gallegos
R. Gallegos
The Friars
Convents
Mt Aymond
Asses Ears
Possession Bay
Mt Dinero
Cape Virgins
Dungeness
Lomas B.
Catherine Pt
Espiritu Santo C.
Gregory Range
Fitzroy Channel
Skyring Water
Oazy Hr
Pocket Hr
Philip B.
Gente Grande B.
Sandy Pt
Freshwater B.
Broad Reach
C. Monmouth
C. Boqueron
Useless Bay
C. Valentyn
Famine
Froward Reach
Dawson I.
Clarence I.
Longitude W. 65 of Greenwich
W. & A. K. Johnston, Edin.r

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CHAPTER I.

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In the month of June 1866 I had the good fortune to receive the appointment of naturalist to H.M.S. "Nassau," a small steamer of between six and seven hundred tons, then about to leave England, under the command of Captain R. C. Mayne, for the purpose of surveying the Strait of Magellan and the adjacent channels on the west coast of Patagonia; and, about two months later, I joined the above-mentioned ship, which was fitted out at Woolwich Dockyard. On the 24th of August, all preparations being completed, we set forth, leaving the Woolwich Arsenal, off which we had been lying for some days, and proceeded down the river as far as Greenhithe, where we remained for the night. Next morning we started for Spithead, which we reached about 5 o'clock A.M. on the 26th, a beautiful bright Sunday, which displayed the wooded slopes of the Isle of Wight to full advantage. On the following afternoon we left our anchorage, but did not proceed far, in consequence of a strong head-wind, which compelled us to come to a halt in Yarmouth Roads, where we spent the night, leaving early on the 28th for Plymouth. Soon after we got under way I gained a fine view of the Needles, which I had never had an opportunity of seeing previously; and, in the afternoon, I spent some time on deck, gazing with interest on

the high and rugged cliffs of the coast of Devonshire. We had a fair wind, though there was rather more motion than was entirely agreeable to a landsman on his first cruise; and late in the evening we arrived in Plymouth Sound, moving up the following day into Hamoaze, where we lay for about two days. This time I occupied, not unprofitably, in making myself acquainted with the pretty country in the neighbourhood, and also in stowing my books and scientific apparatus as advantageously as the limited space at my disposal permitted. Owing to the comparatively small size of the vessel, and the large amount of room occupied by her necessary stores and equipments, there was but little accommodation for specimens, the greater number of which I was in consequence obliged to pack away, as I best could, in my cabin. This, my destined study, museum, and bedroom, for the next three years, though not of large size (6 feet long and broad by 7 high), was wonderfully comfortable, possessing the inestimable advantage of being on deck, and thus providing me with an abundant supply of light and fresh air—important items at any time, and particularly so in connection with the special nature of my work.

Shortly before noon on the 8th of September, a fine day, but with a rather low barometer, we left the harbour on our outward-bound voyage. Towards evening, however, it began to blow, and the wind freshening steadily during the night, by the morning of the 9th we encountered a violent south-westerly gale, accompanied with a very heavy sea, which caused the vessel to pitch prodigiously, initiating a series of tortuous evolutions for which she afterwards became famous. It being impossible to struggle on our way against such formidable obstacles, we attempted to make Brest in the course of the forenoon; but, frustrated in this by the fogginess of the atmosphere, we altered course and ran for Plymouth. As may

be readily conceived, the circumstances were not favourable for beginning a course of observations on Natural History (with, no doubt, the exception of the phenomena attendant on sea-sickness). I find it, however, recorded in my Journal, that through a mist of "mal de mer" I had my first sight of stormy petrels (*Thalassidroma pelagica*); that two small land birds (apparently buntings) made their appearance on board; and that in the afternoon a fine school of porpoises (*Phocæna communis*) were seen close to the vessel, first showing their dorsal fins and then rolling over so as to exhibit nearly the whole of one side, as they rioted through the stormy water, which for them had no terrors. As I lay awake that night, and listened to the tumult of the elements around, while floods of sea-water poured under the door of my cabin, transforming the deck thereof into a pond, in which a variety of books, insufficiently secured in their shelves, were swimming about, I could not help thinking that this was a rather rough beginning of life at sea; and speculating as to how much more of it we were likely to be called upon to endure before the completion of our work.

Late on the evening of the 10th we reached Plymouth Sound, and there lay at anchor for the greater part of a week, the weather being, for some time, of a too unsettled nature to render a fresh start advisable, there being a prevalence of wind and rain every day. Those who have had a like experience will realise the irksomeness and weariness of detention on the coast of England after all farewells had been said, and sympathise with us in our feelings of satisfaction when, on the afternoon of the 17th, a day of mingled showers and sunshine, but with the wind down and the aspect of things in general promising, orders were received to prepare to go to sea. Accordingly, after sunset the same day, on one of the

most lovely evenings I have seen, the anchor was weighed, and we steamed out of the Sound, obtaining our last view, for some time to come, of the reaches of purple undulating moorland stretching to the horizon beyond Plymouth, and the tree-covered slopes of Mount Edgecumbe. It was a night of serene beauty, and I lingered on deck for a time, taking a last look at the land. The stars were bright and clear, and the moon cast a track of splendour on the heaving bosom of the water. At length the Eddystone light died out of sight, and I retired to rest, realising that what had been a long-cherished dream was in process of being accomplished—the opportunity of seeing for myself, in their natural condition, the animals and plants of other climes.

On the following day much rain fell. The wind was right ahead, and we steamed on against it, rolling very heavily at times. In the forenoon, several porpoises were seen gambolling about after their peculiar fashion, and a solitary tern was observed flying over the water. Towards the close of the afternoon the weather cleared up, and the sun appeared for a short time before setting. There was a fine yellow, rainy-looking sunset, accompanied by a faint rainbow. On the 19th, we were well into the celebrated Bay of Biscay. It was a bright sunny day, and after a time, the wind shifted into a rather more favourable direction, which permitted of fore-and-aft sails being employed, so that, in addition to being kept more steady, we were materially assisted on our way. A variety of sea-birds, including gulls, terns, and stormy petrels, were seen. The 21st was also fine, but the wind less favourable. In the forenoon a couple of small whales* were seen, and in the afternoon a large merchant-ship, the "Sardis" of London,

* It may be worth while recording, for the benefit of naturalists who have not travelled abroad, that all *Cetacea* which are not of very great size, but at

passed near and compared latitudes with us. The 22d was a stormy day, accompanied with much rain, and nothing whatever to be seen but stormy petrels flying over the waves astern, now dipping into the water, and anon emerging, the bright white patch above the tail showing very distinctly. On the 23d, Sunday, the water had assumed a magnificent deep indigo tint, and the waves on breaking often exhibited immediately below the crest exquisite violet shadows, reminding me of a similar appearance produced in the Rhine where it emerges from the Lake of Geneva. The 24th was a glorious day of brilliant sunshine, accompanied with great heat, and the colour of the water now appeared as an almost unnaturally vivid cobalt. A shoal of flying-fish was seen for the first time, as well as one or two turtle basking on the surface of the water; and at the close of the day a fine sunset was succeeded by a wonderful moonrise.

Soon after breakfast on the following morning land was reported on the port-bow. This, the rocky islet of Porto Santo, about forty miles distant from Madeira, first became visible in the form of two or three little detached peaks rising out of the water, which, as we lessened our distance from them, were seen to be mountain-tops connected by intermediate low-lying country. Though barren-looking, this satellite of Madeira formed a striking and not unattractive object, as its precipitous cliffs were lit up by the sunshine of this bright day. Despite its limited area, it possesses much interest for the naturalist, both as regards its geological structure and the characters of its flora. As in Madeira, volcanic rocks of the upper miocene period prevail; and the flora, though

the same time are larger than porpoises, are classed by seamen under the generic name of "blackfish," while unknown species of fish are generally "rock cod" or "mullet."

resembling that of the larger island, embraces a variety of species which are not to be met with upon it. A portion of the entomology has been carefully worked out by Mr. Wollaston, in his *Coleoptera Atlantidum*, and 160 species of beetles are recorded by him from this island, while 598 are assigned to Madeira, and 87 to the three Desertas. It is also famous for its breed of rabbits, of which Mr. Darwin has given an account in his *Variation of Animals and Plants under Domestication*. In 1418 or 1419, a litter of rabbits was placed on the island by J. Gonzales Zarco, and these increased so rapidly "that they became a nuisance, and actually caused the abandonment of the settlement." Mr Darwin, who has instituted a careful comparison between this feral breed and the English wild rabbit, has pointed out that they differ conspicuously from it in their much smaller size, as well as in the colouring of their fur, and remarks on the wildness of their habits as observed in a pair kept for some time in the Gardens of the Zoological Society.

By the middle of the forenoon the mountains of Madeira were sighted, emerging from a bank of white cloud ; and as we gradually approached, the general aspect of the land became very fine, ridge rising beyond ridge to the horizon. As we passed between the Desertas and the remarkable tongue of land which terminates the eastern portion of the land, the jagged volcanic rocks on S. Lorenzo Point and Fora Island stood out, hard and sharp, like the teeth of a saw, against the yellow sunset sky ; and between 7 and 8 P.M. we entered the Bay of Funchal. It was a moonlight night of indescribable beauty, several of the planets showing out clear and bright, and the town of Funchal looked exceedingly pretty ; its white houses, with their glancing lights on

the hill-slopes, displayed in strong relief against the deep ravines and lofty heights around them.

Next morning we learned, greatly to our disgust, that we were placed in quarantine for five days, with, however, permission to get what coal and provisions were required, and to despatch letters home. I occupied a considerable portion of the forenoon of that day in gazing on the paradise which we were forbidden to enter,—truly a "pearl of the ocean" under any circumstances, and one which appeared all the more inviting to us after the rainy weather we had lately experienced in the south of England, and our rather rough sea-cruize, as it lay steeped in sunshine, its gardens glowing with masses of brightly-coloured flowers, and a profusion of prickly pears, sugar-cane, and maize, with here and there a dwarf palm communicating strongly-marked features to the vegetation. The Loo rock, with its fort, formed a prominent object in the foreground ; and behind and on either side of it were remarkable cliffs, some of which exhibited very striking examples of perpendicular basaltic columns, resting unconformably on what appeared to be stratified rocks. Before long a boat, with a supply of fruit, embracing bananas, fresh figs, grapes, apples and pears, came alongside ; and it is needless to say that its freight was speedily disposed of. The grapes were excellent, but the apples, though pleasant to the eye, being both large and well-coloured, were not at all equal to our English fruit, possessing much hardness and but little flavour. Later in the day we accomplished a little dredging from the ship, the dingy being despatched with one of the dredges to some distance astern, and the dredge being thereafter put over, was gradually hauled in towards the ship. By this means we procured several pretty molluscs and a few echinoderms, including a handsome, though small, *Ophiocoma*. Of

all the molluscs obtained, by far the most plentiful was an elegant minute *Dentalium*, with a sharp marginal rim. Many of the animals of this species were alive, and there was a regular deposit of dead shells in the fine gray mud of the bottom.

We did our best to vary our term of imprisonment during the two or three days following, which were very hot (the thermometer 85 in the shade), by fishing expeditions, in the course of which we captured one or two specimens of a species of *Caranx* (probably *C. dentex*), several splendidly-coloured wrasses (*Labridæ*), a small example of one of our own British dogfish, and a young hammer-headed shark (*Zygæna malleus*), which made its presence known to us by tugging viciously at one of our lines, which it succeeded in breaking as it was hauled up to the surface of the water. However, apparently not having learned wisdom by experience, it returned in a short time, and was again hooked, and this time safely landed in the bottom of the boat, where it lay flapping about, no one feeling particularly desirous of handling it. I subsequently examined it with much interest, as it was the first fresh specimen of this curious genus that I had seen. Its length was 27 inches, and the breadth of its extraordinarily-shaped head (measured from eye to eye) $6\frac{1}{2}$ inches. After skinning it, I threw the carcase overboard at one of the gangways, and immediately after became the eye-witness of a most singular spectacle, for a swarm of a species of fish, somewhat resembling a small bream in shape, of a bluish-green colour above and silvery beneath, and which we had observed constantly swimming about the ship, but had not succeeded in obtaining, made their appearance, flying upon the shark, and fighting most vigorously for possession. As nearly as I could calculate the number, there could not have been much fewer than a hundred

individuals, varying from 6 to 9 inches long ; and in a space of time almost incredibly short, the mortal remains of the shark disappeared from my astonished gaze, having been devoured piecemeal. Dredging was carried on from time to time as opportunities occurred, and a considerable number of molluscs, including species of *Rissoa, Natica, Haliotis, Pecten, Cardium, Pullastra, Venus, Tellina, Solecurtus,* etc., as well as a few echinoderms, were obtained. That noted dredger, Mr. M'Andrew, who has carefully investigated the molluscan fauna of Madeira, under much more advantageous circumstances, has recorded 156 species, "of which 44 per cent are British, 70 per cent common to the Mediterranean, and 83 to the Canaries."* Large gulls, apparently our British greater black-backed species, and small terns, were frequently to be seen fishing about the harbour, the large birds often bullying their smaller neighbours, who sometimes collected in flocks on some of the rugged projecting rocks. Our fishing and dredging operations were not seldom viewed with considerable curiosity, at a safe distance, by the boatmen, who, for the most part, pursued their avocations in a very light and airy costume, consisting of a shirt and an odd little peaked cap.

Our period of enthralment at length came to an end at noon on the 1st of October ; and, after the dirty-looking old guardiano who had been keeping watch and ward over us for the last five days, had fumigated us to his satisfaction, and the Portuguese doctor had come on board and satisfied himself as to our state and condition, we received the welcome permission to go on shore as soon as we chose. Accordingly, a considerable number of us landed that afternoon, and, under the guidance of one of the officers who had

* S. P. Woodward—*Manual of Mollusca,* 2d edition, p. 65.

visited Madeira on a previous occasion, I viewed the lions of Funchal. As is always the case in traversing the highways and byways of a foreign town unfamiliar to one, my attention was arrested by a variety of minute circumstances which an English resident would hardly think it worth while to notice. Thus, I remarked with interest the narrowness, steepness, and slipperiness of the streets; the peculiar vehicles, somewhat resembling exaggerated sedan-chairs, resting on curved runners, after the manner of sleighs, and drawn by oxen; the cloth-litters, slung on poles, in which people were being borne along; and last, though certainly not least, the luxuriant growth of the plants in the gardens—the heliotropes, to cite a single instance, attaining a height of six or seven feet.

Next morning three of the officers and myself landed to make an excursion to the well-known Grand Curral, a remarkable deep valley about the middle of the island, surrounded by precipices from 1500 to 2500 feet high, and peaks of very considerable elevation, the Pico Grande attaining a height of between 5000 and 6000 feet. Sir Charles Lyell remarks,* that "it has been compared by some to a crater or caldron, for its upper portion is situated in the region where dikes and ejectamenta abound," but that it extends to below the region of numerous dikes, that the volcanic masses do not dip away in all directions from it, as from a central point, or from the hollow axis of a cone, and that, in fact, it is only one of three great valleys radiating from the most mountainous district of Madeira, the second valley being that of the Serra d'Agoa, separated from the Curral on the east by a narrow and lofty ridge, part of which is surmounted by the Pico Grande; and the third the valley

* *Elements of Geology*, ed. 6th, p. 644.

of the Janella, which, unlike the other two, sends its water to the north.

It was a day of most exquisite beauty, and thoroughly enjoyed by all of us. We found our horses awaiting us at the landing-place, and after having captured a large sphinx-moth, which was flying about over the stones, we mounted, and accompanied by our guides, who occasionally aided their progression by holding on to the quadrupeds' tails, rode out of the town at a brisk pace. The ride, as all who have accomplished it will acknowledge, is a singularly interesting one, the track lying through valleys and along the side of steep hills, alike richly clothed with vegetation, and commanding numerous fine views of the surrounding country; and the horses are admirably trained, very sure-footed, and most willing animals.

The distribution of the plants, native and cultivated, as influenced by the height above the sea-level, was very curious to observe as we gradually ascended the mountain-sides. On the lower ground, vines, guavas, figs, yams, bananas, maize, sugar-cane, prickly pears, and small palms, abounded, while at a higher level walnut and sweet chestnut trees prevailed. A wonderfully accurate register of the increase of elevation to which we attained was afforded by the vine alone; for in the neighbourhood of Funchal the grapes were all gathered, higher up a few over-ripe looking bunches were still to be seen; still higher the fruit was in perfection, while at the utmost limit of the plant, the bunches were not in a sufficiently advanced condition to gather. Roses, fuchsias, and geraniums, ran wild along the roadside on the lower ground; the beautiful belladonna lily (*Amaryllis belladonna*) was in profusion at a higher level; farther up the mountain-side occurred a well-marked zone of a species of broom (*Spartium virgatum*) with small yellow flowers, and this was in its turn succeeded by a stout and tall-growing heath (*Erica arborea*). This succession

of forms only prevails, however, to a limited extent, as Dr. Hooker has observed, that on ascending "the mountains of Madeira, above 5000 feet and up to their summits (6000), we find little or none of that replacement of the species of a lower level by those of a higher northern latitude with which we are so familiar in ascending any continental mountains of equal or less height. Plants become fewer and fewer as we ascend, and their places are not taken by boreal ones, or by very few."*

As we rode along, we observed butterflies of various species, including our common small copper (*Lycæna phlœas*), a white *Pontia*, and a brilliant yellow species (probably the *Colias edusa*), flitting about; and multitudes of little lizards basked in the sun, or ran about on the walls, which were richly provided with a garniture of ferns, among which I noted the elegant *Davallia canariensis*, and some familiar British ferns, and the rare *Adiantum capillus Veneris*, and the common *Asplenium trichomanes* and *Polypodium vulgare*.

At length, after an ascent of several hours, we reached a height of upwards of 4000 feet, having left the region of trees behind us, and were informed by our attendants that we must now dismount and walk up to the summit of the mountain, which constituted our journey's end. This we accordingly did, and proceeded to scramble up a steep grassy slope, some of us aiding our movements with long sticks shod with iron, reminding us of alpenstocks. On reaching our destination, we were rewarded by a magnificent view of a ravine more than 2000 feet deep, together with the neighbouring heights, and the distant quiet blue sea. After resting for a while we retraced our steps to where we had left the horses, and having mounted, rode rapidly back to Funchal, getting on board

* *Lecture on Insular Floras*, p. 4.

about 5 P.M. The same evening we went to sea, to my considerable regret, as I should much have liked to obtain a more familiar acquaintance with the zoology and botany of this interesting spot. The advanced state of the season, however, rendered it advisable that as little time as possible should be occupied in the outward-bound voyage, in order not to lose more than could absolutely be avoided of the summer in the southern hemisphere.

On the 3d nothing specially worthy of record occurred, save that at sunset a most curious effect was produced by heavy rain falling at some distance from the vessel, so as to cause the water in its vicinity to appear of a dull gray colour, while that immediately surrounding us was of a deep purple tint. On the 4th at daylight, Palma, one of the Canaries, noted for its wonderful Caldera, was indistinctly observed looming through the haze. We had a towing-net overboard, and in the course of the afternoon a small Pteropod (*Pneumodermon*) was taken in it. The heat during the day now began to be very oppressive, and the evenings after sunset were decidedly the seasons when most enjoyment of life was experienced by us, many pleasant hours being spent sitting on deck enjoying the moonlight and watching the phosphorescence of the waves, and the brilliant track cast by the planet Venus on the water. On the 5th, I again tried the towing-net, but with little success, owing to the speed at which the vessel was going, the sole objects captured being a small *Ianthina* (*I. violacea*), and a minute fragment of the shell of a *Spirula*. On the 6th, flying-fish were seen in abundance, and I have no hesitation in affirming, from my own observations, then and on many other occasions, that (as has been recently remarked by both Wallace and Collingwood), the power of genuine flight is possessed to a much greater degree by these animals than

was at one time admitted by naturalists. They not only have the faculty of flight for some distance in a direct line, but also are capable of turning while in the air at nearly a right angle, so as entirely to change the direction of their course. We passed into the tropics on the evening of the same day, when there was a magnificent display of phosphorescence on the sea, globes of fire of various sizes passing by close to the vessel. This striking phenomenon, on which so much has been written, though to be witnessed more or less in all seas, is certainly most distinctly manifested in the tropics, where it has attracted the attention of voyagers for centuries. Thus, in "The Second Voyage of John Davis with Sir Edward Michelborne Knight into the East Indies,"* it is recorded that on the 12th of February 1605, when a little to the north of Ascension, "wee found ourselues to bee in seuen degrees fiue minutes to the south-ward; in which place at night I think I saw the strangest sea, that euer was seene; which was, That the burning or glittering Light of the Sea did show to us, as though all the sea ouer had been burning flames of fire, and all the night long, the moone being downe, you might see to reade in any book by the light thereof."

Next day I had an opportunity of examining a flying-fish (*Exocœtus obtusirostris*) for the first time, and was much struck by the approximation of the eye to the termination of the snout. I was also interested to observe a large dragon-fly skimming about the ship; and the following morning, when we were still nearly 200 miles from the nearest land, a small brown butterfly was noticed.

We reached St. Vincent, in the Cape de Verdes, on the 9th, a few hours later than we had calculated upon, in consequence of the neighbouring island of Santa Lucia being mis-

* *Purchas his Pilgrimes*, vol. i. book ii. p. 132.

taken for it, owing to the misty state of the atmosphere which commonly prevails in the neighbourhood of this group of islands. In skirting along the coast of the island, the savage, intensely volcanic, barren appearance, of its ridges and heights, made a profound impression upon me. The ruggedness of the cliffs was added to by the occasional presence of projecting dikes; and, at first sight, with the exception of a few stiff-growing shrubs, which I felt pretty certain were *Euphorbias* (a conclusion subsequently verified), there appeared to be an utter destitution of vegetation of any description. But as we turned a projecting point, and opened the bay of Porto Grande, I was agreeably surprised by finding that a considerable portion, alike of the low ground near the beach, and of the slopes of the hills, was rendered green by a covering of herbaceous plants. I was the more astonished by this, as I had been informed by some of my companions, who had previously made acquaintance with the island, that I would find that it presented much the appearance of a gigantic cinder. This unusual display of verdure, was, as I afterwards learned, the result of heavy rains shortly before our visit—a phenomenon of very rare occurrence at the present time on this arid spot. The fertility of the Cape de Verdes appears, however, to have been considerably greater three centuries ago than it is now, if we may trust to the accounts given of them by some of the older navigators. Thus Drake, who visited them in 1578, speaks favourably of Mayo, St. Jago, and Brava, remarking on the sweetness of the grapes and the excellence of the cocoa-nuts, on the first; and observing of the second, that it is "faire and large, and, as it seemeth, rich and fruitful;" and, of the third, that it is a "most pleasant and sweet island, the trees whereof are always greene and faire to look upon." Mr. Darwin also mentions, on the

authority of Dr. Dieffenbach, that when St. Jago, which now appears to equal St. Vincent in barrenness, was discovered, "the immediate neighbourhood of Porto Praya was clothed with trees, the reckless destruction of which has caused here, as at St. Helena, and at some of the Canary Islands, almost entire sterility."

We came to an anchor soon after noon, and shortly after a ceremony, with which all those who have visited foreign parts are familiar, took place,—the arrival alongside of the health-boat, with a doctor and interpreter in her; the former being, in this instance, a queer-looking old fellow in a wide-awake hat, with a handkerchief wound round it, and provided with a symbol of office in the form of a long stick; who was at first anxious to put us in quarantine for a couple of days, but on being told that in that case we would not remain but proceed on our way, graciously relented, and granted us "pratique," much to our satisfaction. Thereafter several boats came alongside with a cargo of fruit, consisting of very green oranges and bananas, grown on the neighbouring island of St. Antonio, which boasts some permanently verdant patches. A cage of beautiful little love-birds (*Psittacula pullaria*) was in addition offered for sale, but met with no purchasers. But few of us went on shore that day, some of those who remained on board occupying their idle time in fishing, and meeting with tolerable success. Among the fish obtained in this manner was a specimen of the curious *Argyreiosus setipinnis;* but this was unfortunately thrown overboard by mistake.

The next morning I landed with Captain Mayne and some of the officers who were going to take sights, and walked with them to the office of the British consul, Mr. Miller. As he had not yet come down from his house on the hills, I

occupied myself, while the others were engaged in their observations of the sun, in watching the movements of a jumping spider (*Salticus*), which was keeping an eager look-out for flies, and in gazing out on the blue waters of the bay, in which numbers of negro children were disporting themselves, and on the rugged yellowish peaks of the island, standing out in sharp contrast to the cloudless blue sky of this glaringly hot day. Before long Mr. Miller arrived, and I received a good deal of information from him relative to the leading features of the natural history of St. Vincent, which, he mentioned, had been visited not long before by three well-known naturalists—the Rev. Mr. Lowe, Mr. Vernon Wollaston, and Professor Dohrn of Stettin. In reply to my inquiries, he told me that there were about twenty-seven species of birds on the island, no snakes, two species of lizards, and a considerable number of insects ; and that in the bay a variety of fish, mollusca, and crustacea, were to be met with. He mentioned that sharks were not common ; but that a blue shark, on which the inhabitants of Porto Grande had bestowed the cognomen of "Seraphine," paid periodical visits to the bay, and that a gigantic species of Ray was not uncommon, and much dreaded by the negroes, who believed that it enfolded its victim in its great pectoral fins, and then lacerated his body with a sharp dorsal spine—an account reminding one of the legends of the great devil-fish of North America. Mr. Miller also informed me that the island was at this time more covered with vegetation than it had ever been before during the whole period of his long residence upon it; and kindly offered me the use of a horse and guide if I felt disposed to investigate the state of matters for myself.

Gladly accepting this proposal, and my steed having been got ready, I mounted, and rode off at a leisurely pace, accom-

panied by a negro lad, who had received instructions where to conduct me. I was provided with a small tin vasculum, which I had brought on shore on speculation, and in this I stowed away my specimens as I met with them. I well remember the curious and novel sensations which, while riding over the desert plains, covered with a strangely unfamiliar tropical vegetation, composed principally of succulent plants, salt and bitter to the taste, and brightly-coloured *Labiatae*, characteristic of such barren situations, I experienced. On the sandy flats, not far from the sea, a thorny species of *Acacia*, and another plant, which in its general growth, made me think of Tamarisk, were abundant, together with a species of gourd, which covered the sandy soil with its trailing stems, and exhibited flowers and fruit in various stages of maturity. After ascending a little way, the prostrate stems, brilliant yellow flowers, and prickly fruits, of a species of *Tribulus* became conspicuous, together with a variety of grasses, among which were representatives of the genera *Cynodon* and *Digitaria*, and also a millet-like grass, which my companion, with whom I carried on as much conversation as the limited acquaintance which we possessed of each other's languages would permit of, informed me was "much good for bullock." Still higher up I observed various succulent *Crassulaceæ*, and *Mesembryaceæ*, a yellow-flowered composite plant with a woody stem; a *Convolvulus*, with beautifully-veined leaves and large pinkish-white flowers, exquisitely pencilled with purple; a yellow-flowered leguminous plant like a *Lotus;* a wild fig; a shrubby *Datura;* and the *Euphorbia* previously mentioned, unmistakable from its stiff artificial-looking manner of growth, and abounding in milky acrid juice. Numbers of Egyptian vultures (*Neophron percnopterus*) were soaring about in the air in all directions, and perching on the crags; the old birds in

their characteristic black and white attire, and their offspring in their uniform dark-brown plumage.* Grasshoppers of different species, and all sizes, were in plenty, skipping about among the low herbage, and producing a sound as of a multitude of miniature knife-grinders; and I saw a single specimen of a sphinx, which I believe was the privet hawk moth (*Sphinx Ligustri*), as well as several dark-coloured butterflies (*Diadema Misippus*), with large white spots on the wings.

Low down on the plains the heat was most oppressive, but after ascending to a considerable height on the hills there was a comparatively cool and refreshing breeze. At length we arrived at the summit of an elevated ridge, from whence we had a fine view of the sea and the greater part of the island; and my guide, who had by this time confided to me that his name was "Jeduat," and that he came from Boavista, another of the islands of the Cape de Verde group, intimated to me that this was to be our terminus. Not far from where we halted was a small cottage surrounded by a little plantation of maize, to all appearance grown under great difficulties, on a scanty sprinkling of soil on the top of the rock, which cropped out between nearly every plant; and as I was very thirsty, I requested my companion to inquire if we could get some water to drink. On his receiving a reply in the affirmative I dismounted, and scrambling over the low stone wall which surrounded the enclosure, proceeded to the door of the dwelling, where I was accosted with "Walk in" in English, by a pleasant-looking negress, who forthwith provided me with some of the desired fluid. In requital of her civility, I presented her with an English silver threepence, which appeared to delight her greatly, as she thereupon

* I did not observe any Guinea-fowl during the short period of our stay in St. Vincent, and was told that they had become very rare.

remarked, with much emphasis, "Englishmans very good mans," and proceeded to arrange a mattress on a rough settle, making me understand that I was to rest myself there while she boiled two hens' eggs for me, which she produced from an old chest. This I was not loath to do, as I was pretty well tired with the heat; and while she went off to prepare the eggs in her kitchen, which was a separate edifice, I had leisure to survey the dwelling, which consisted of two small rooms, divided by a partition. The walls were constructed of blocks of stone, cemented with mud; the roof was formed of a kind of coarse basket-work, supported on rough poles; and there was a single window, with, it is almost needless to say, no sash. A charming little naked negro boy did the honours of the house to me while I rested, chattering most volubly in Portuguese, and pointing out the dog and the hens for my inspection. After my repast I took my departure, my hospitable entertainer accompanying me to my horse, shaking hands very heartily, and bestowing on me a parting gift of a head of green maize, wrenched off from one of the growing plants. I then rode back to the consul's office, passing through the town, where swarms of fat stark-naked children were running about the streets; and after joining the other officers, who had now concluded their observations, returned to the ship with them.

On the following day I landed with three of the officers, and having procured horses through the kindness of Mr. Miller, we set out, accompanied by a negro man and boy (the latter of whom carried my large vasculum, and formed a most efficient plant-gatherer), on a ride over the hills to a sandy bay, between the N.E. and E. points of the island. In the course of the ride I found a very considerable number of species of plants, including a prickly species of *Asparagus* and a fern, both of which occurred at the summit of one of the

hills, and a plant with beautiful purple convolvulaceous flowers, which trailed over the sand at the edge of the beach for yards. I had hoped to have sent home a fair representation of the flora of this island; but my expectations unfortunately came to naught, as the greater number of my specimens were subsequently destroyed in the course of our hot damp voyage through the tropics. This is the less to be regretted, as the Rev. Mr. Lowe has carefully worked out the botany of the entire group. In his lecture on Insular Floras, delivered before the British Association in 1866, Dr. Hooker remarks that, on his visit to the Cape de Verdes in 1839, he found that the plants of the lowlands were purely African and Arabo-Saharan in character, but that on the mountains a few occurred which were very characteristic of the Canaries and Madeira. He also mentions some of the results obtained by the recent investigations of Mr. Lowe, viz. that "the mass of the flora is African, and that the mountains contain many Canarian types; but that all these are the types that have representatives in the Mediterranean region; whilst of these peculiar Canarian, Madeira, and Azorean plants, that have no near allies or representatives in Europe, not one is found in the Cape de Verdes, with the single exception of the Dragon's-blood tree. Also, ascending above the tropical zone to 3000 feet and upwards, many of the same middle-European plants are found, that appear at correspondingly lower elevations in Madeira, the Canaries, and the Azores."

On reaching the sandy bay which I have mentioned, we dismounted, and rested for a while close to the beach, on which I observed several large broken shells of a species of *Sepia*, lying. Here my horse took advantage of a momentary fit of absence of mind on my part to munch off the heads of a bunch of plants which I held in my hand before placing

them in my vasculum. In about an hour's time we remounted, and commenced to ascend the hills by a different route from that by which we had come; and, on our way back, our guide caught two large spiders for me, which he appeared to regard as rare and remarkable animals, and I collected some additional plants. At the close of the afternoon we reached Mr. Miller's house, most agreeably situated on a hill commanding a fine view of the bay; and after dining there, this very pleasantly spent day was terminated by a ride down the hills by lantern-light to Porto Grande. On our return to the ship, I found that some of the officers had made me a small collection of Molluscs, Coleoptera, etc., together with a little lizard of the Gecko family — the *Tarentola Delalandii*—which also occurs in Madeira and on the West Coast of Africa.

On the afternoon of the 12th I again went on shore, and had a pleasant ramble with two of the officers. Our way lay for some time over a tract of sandy low-lying ground near the beach, where the thorny *Acacia* already mentioned was very plentiful, and a species of *Solanum*, with prickly leaves and purple flowers, was also observed. We succeeded in capturing a second species of lizard (the *Euprepis Stangeri*) which is also an inhabitant of West and South Africa. Two species of butterflies were observed—one the white-spotted species seen on my first excursion, and another in which orange was the prevailing colour. Several Coleoptera were taken. A species of *Cicindela* (*C. Hesperidum*) was rather plentiful on the outskirts of a salt-marsh, but no specimens were obtained, owing to the activity of the insect, which always took wing when approached. In his *Coleoptera Hesperidum*, Mr. Wollaston states the number of species of beetles ascertained to exist on St. Vincent as 132; and the prevailing forms in

the Cape de Verde group are the genera *Oxycara* and *Trichosternum*, belonging to the Heteromous section of the order. In the course of our walk we noticed some fine examples of wind-blown ridges of sand, exactly counterfeiting ripple-mark. After a time, we descended to the beach, and spent an hour or two in search of marine animals. We found the shore at high-water mark thickly strewn with dead shells, among which the genera *Conus*, *Purpura*, *Cypræa*, *Spondylus*, *Arca*, and *Venus*, predominated, as well as numerous examples of water-worn corals, chiefly belonging to a species of *Astræa*. The state of the tide fortunately permitted us to investigate the pools in a flat reef of rocks extending for some distance along the bay; and in these we met with a variety of live animals, the collection of which required to be conducted with caution, as a heavy surf broke over the rocks at short intervals. A curious little blennioid fish, the *Clinus nuchipinnis*, darted rapidly about the pools in numbers, and required some dexterity to capture; and a small *Octopus*, probably of the same species as that of which Mr. Darwin has given such a lively description in his account of his visit to St. Jago, caused us much amusement by the agility of its movements—swimming through the water with great rapidity, tail foremost, occasionally discharging the contents of its ink-bag to screen itself from observation, and, when placed on the rock, scrambling along at a great rate, by means of its arms, in such a fashion as to remind us of a frog. A large *Aplysia* (*A. dactylomela*), also mentioned by Mr. Darwin, was not uncommon, and discharged a brightly-coloured fluid, varying from purple to carmine, when handled. Among the other molluscs found by us were a *Conus*, a small *Mitra*, many specimens of *Purpura neritoides*, and examples of *P. hæmastoma*, *Littorina*

striata, Labeo punctata, Leucozonia triserialis, and *Siphonaria venosa.* A rather large elliptical sea-urchin (*Echinometra*), with long dark purplish-black spines, was very abundant, adhering with such firmness by its suckers to the semi-circular hollows in which it was lodged as to require a considerable amount of force to detach it. A few Crustacea and sponges, and a variety of Algæ (a species of *Padina,* I may remark in passing, was very common) were also procured ; and on our way back to the town I picked up, on the beach, a Cirriped of the genus *Coronula* (*C. balænaris*), with fragments of the integument of the whale, on which it had lived, still sticking between the septa of the shell, as also the cephalic shield of a *Palinurus.* A specimen of a curious little crustacean, the *Remipes scutellatus,* was also taken by one of the officers, burrowing in the sand of the beach, close to the water's edge. On the following day I remained .on board, busily occupied in putting away the various objects acquired the last three days ; and, late in the afternoon, we bid the island farewell, departing under sail, a matter of rejoicing to us all, as securing a greater amount of coolness and general comfort than could be attained in these warm regions under steam.

CHAPTER II.

VOYAGE TO RIO—TOWING-NET—IANTHINA—PORPITA—PARASITE OR FLYING-FISH—HALOBATES—SWALLOWS—SHARKS AND PILOT-FISH—JASEUR BANK—FORAMINIFERA—ARRIVAL AT RIO—PASSAO PUBLICO—SENSITIVE PLANT—BOTANIC GARDENS—RIO COMPRIDO VALLEY—NICTHEROY—REMARKABLE INSECT-NEST—THORNY PALMS—CURIOUS BUTTERFLY—MARINE ANIMALS—GALE—IDOTEA ANNULATA—PAMPERO—ENTER THE RIVER PLATE—COBWEBS—MONTE VIDEO—AGAVE—TALL THISTLES—VERBENAS—TERO-TERO—PETUNIA—ANTS—POVERTY OF MARINE ZOOLOGY—THE MOUNT.

I AVAILED myself of the opportunity presented while we were under sail, and the revolutions of that useful, but disagreeable piece of apparatus, the screw, temporarily suspended, to bring the towing-net again into operation, and met with a certain amount of success. Thus, on the 14th, a curious little fish, of a blackish colour, with a large mouth armed with long teeth (*Astronesthes niger*), one of the Erichthoid Crustacea, *Alima hyalina*,* and a lovely little deep blue *Velella*, were taken. In the course of the same day a large school of porpoises accompanied the ship for some time, and then signalised their departure by a series of flying leaps through the air. Next day we observed large numbers of *Ianthinæ*, with their curious floats, on the structure and formation of

* In the *Annals and Magazine of Natural History* for June 1868, Mr. Spence Bate states that he has reason to believe that *Alima* is but the second stage in the development of Squilla and allied forms, and I have since been informed by Dr. Anton Dohrn that there can be no doubt that such is the case.

which so much has been written. According to one of the most recent investigators of the subject, M. Lacaze-Duthiers, the float "is increased by complicated movements of the anterior part of the feet, which result in forming an air-bubble enclosed in a glutinous matter," and the *Ianthina* cannot produce a float as long as it is beneath the surface of the water. A fine specimen of this beautiful creature, captured in the towing-net, proved to be the *I. globosa*, and had two specimens of a small *Lepas* attached to its fragile shell. A species of *Porpita* was also present in great abundance, and a number of specimens were taken and consigned to spirits. On the morning of the 16th a large flying-fish came on board, but I had not an opportunity of examining it, gastronomy having prevailed over zeal for science before I was out of bed. A curious parasitic crustacean (*Ceratothoa*) found in its mouth was, however, preserved and presented to me. Several Pteropoda also occurred in the towing-net, chiefly species of the genus *Pneumodermon*, as well as several specimens of a curious aquatic insect of the genus *Halobates*, which swims about on the surface of the sea in the same manner as some of its allies do on that of fresh-water streams. Some swallows were seen at this time, and a young individual was caught. The poor little bird was much exhausted, and drank a little water eagerly, but would not eat, and on being afterwards let go, it flew for some distance and then fell into the water. On the 18th I only obtained a few Acalephæ, and my towing-net work was brought to a close by our getting up steam, owing to the failure of the breeze which had thus far accompanied us. A grasshopper was brought to me in the course of the day, but possibly it had travelled with us from St. Vincent.

On the morning of the 19th a small Remora (*Echeneis*

lineata) was picked up on deck, having probably come in on the log-line. Later in the day two swallows were captured, one of which revived temporarily on being fed with flies, but died a few hours after. On the 20th we fell in with a pleasant breeze, which lasted for some days. On the 21st we saw the sun set in the northern hemisphere, and in the evening a most brilliant meteor, so closely resembling a rocket bursting, as to be at first supposed to be a signal from some vessel, was observed by a party of us who were sitting on deck enjoying the moonlight. The following morning we crossed the line, but the event was not celebrated by any time-honoured ceremonies—I cannot say to my disappointment ; and instead of an orthodox dead calm, we had a most refreshing breeze, which carried us well on our way.

On the 23d the breeze still continued. Large flocks of flying-fish were observed, and a petrel of a uniform sooty colour, and larger than the Mother Carey's chicken, appeared near the ship. I had also my first sight of the Portuguese man-of-war (*Physalia*), several large and exquisitely-tinted specimens, which I attempted unsuccessfully to capture, passing close to us. Their floats were provided with a beautiful ribbed purple margin. During the afternoon a large shark was seen in our vicinity, and some flocks of birds were descried in the distance. Next day, the breeze continuing steadily to freshen, the screw was got up and sail made. This accomplished, we went along at a capital rate, over a sea the splendour of the blue of which only those who have passed through the tropics can fully understand ; while the stormy petrels, which certainly, according to my experience, are as commonly to be seen in fine as in bad weather, followed in our wake, flying over the white-crested waves. On the 25th a tropic bird (*Phaethon*) was seen, but nothing else worthy of

record occurred. We kept a fresh breeze for the next two days, but it gradually fell on the 28th, and died away completely towards evening on the 29th, when, there being a dead calm and no signs of any more wind, preparations were made for getting up steam. While this was going on two sharks paid us a visit, coming alongside the starboard gangway. They were about six feet long, and one of them, which was of a rather light-brown, with the pectoral fins tipped with white, was accompanied by half-a-dozen pilot-fish (*Naucrates ductor*), which swam slowly around it, displaying their elegantly barred sides very clearly. A few minutes later a very large fish, probably a shark, but, from being at some depth below the surface of the water, impossible to ascertain its nature with certainty, was seen on the port side of the vessel. A shark-hook was thereafter baited with a piece of salt pork, and put over astern, but the tempting morsel having been unfortunately insufficiently secured, the sharks succeeded in making a supper of it, and getting off scot-free. On the morning of this day we had a very heavy tropical shower, which, though it only lasted a quarter of an hour, sufficed to fill a goodly array of water-cans which were brought on deck.

On the 30th we went along under easy steam, and soundings were taken with the deep-sea lead several times during the day, but no bottom obtained at depths of 500 and 300 fathoms. There was a glorious sunset, the luminary leaving a bright red glow on a bank of dark neutral-tinted clouds behind it, after it had dipped below the waves.

Early in the morning of next day I was roused by the officer on watch to get my first view of the Southern Cross, which afterwards became such a familiar object to us,

and I was much delighted with its beauty, although it is not the sort of pyrotechnic display often represented by travellers. During the last few days we had been shaping our course with the endeavour of picking up the Jaseur Bank discovered by the French man-of-war "Jaseur" in 1825, but apparently not examined since then. This bank is situated in lat. 20·36·30 S., and long. 35·47 W., and is about 60 miles distant from the Victoria Bank, and about 360 from the island of Trinidad. At half-past one P.M. (Oct. 31), as it was believed that we were drawing near the bank, soundings were taken, but no bottom was obtained with 1000 fathoms line. Soon after five P.M. we again sounded, and this time the lead touched bottom at forty fathoms, and one or two fragments of a *Millepora*, with a few Foraminifera, were found attached to the arming. A few minutes later we again reached the bottom with thirty fathoms line, more Foraminifera being found on the lead. Proceeding onwards for a short distance, the process was repeated with a Fitzgerald's apparatus, and a good sample of the bottom, at a depth of 52 fathoms, procured. By 6·30 P.M. we were in a depth of 800 fathoms, and consequently the conclusion was arrived at that the Jaseur is a narrow elevated ridge, probably extending transversely between the Victoria Bank and Trinidad. I subsequently made a careful microscopic examination of the deposit brought up in the Fitzgerald's apparatus, and found that it was principally composed of animal organisms, and that almost no specimens of rock or minerals were present. The animal, which greatly predominated over the vegetable forms (only represented by a few fragments of an incrusting *Melobesia*, and a minute portion of the frond of a living *Ulva* or *Enteromorpha*), were all dead; and the bulk of them consisted of multitudes of the

shells of Foraminifera, principally of the genus *Amphistegina*, a type characteristic of tropical and sub-tropical regions, but also containing examples of *Nodosariæ* of the dentaline structure, and of numerous small portions of corals of various species. A few small shells of Molluscs were also present, and among these I recognised an *Oliva*, a *Lima*, and a diminutive *Pecten*. In addition to these, several fragments of a *Serpula*, and a spine and portion of the dental apparatus of a small *Echinus*, occurred. Of the shell of *Amphistegina*, Dr. Carpenter has given an elaborate account in his learned and valuable *Introduction to the Foraminifera*,* observing that "it closely corresponds in external form with that of *Nummulina*," but that "it is only for some of the smaller Nummulines that it could be mistaken, since its diameter seldom exceeds the 1-8th of an inch." As regards its geographical distribution, he states that it has been found "in various parts of the Indian Ocean, the great Polynesian area, and the West Indian Seas;" that the farthest limits to which it is known to extend northwards are the Red Sea and the neighbourhood of the Canary Islands, while southwards, it has not been traced further than New Zealand; and that it occurs in greatest size and abundance in depths of from 15 to 50 fathoms, but that small specimens have been brought up from abyssal soundings in the Red Sea. The species obtained on the Jaseur Bank, which varied in size from a twentieth to a tenth of an inch, is very convex on the upper, and flattened or concave on the lower surface, and bears a close resemblance to *Amphistegina mamillata* of D'Orbigny, as figured in the *Introduction to the Foraminifera*. As regards *Nodosaria*, on the other hand, Dr. Carpenter remarks, that, under some one or other of its protean

* Page 242.

forms, it is very generally diffused through the seas of various parts of the globe. Geologically, it possesses a much greater antiquity than the former genus (which has not been met with prior to the tertiary epoch), it having been traced as far back as the carboniferous strata.

On the 2d of November we made good way, going along under steam and sail at a rate of about ten knots an hour. In the morning some albatrosses were observed at some distance; and in the afternoon, between two and three o'clock, I had my first view of the New World—Cape Frio being sighted, and our approach to the land further indicated by a gradual change in the colour of the water from a brilliant blue to a dull green hue. Between seven and eight P.M., the well-known light on Raza island became visible, and rather more than an hour later the adjacent conical island of Redonda, with the bold outline of the mainland outside of the Bay of Rio, could be clearly recognised. It was a glorious starlight night, the planet Venus casting a broad track of splendour on the almost unruffled surface of the water, as between ten and eleven o'clock, we neared the entrance of the magnificent harbour, believed at the date of its discovery to be the embouchure of a large river, and hence denominated Rio de Janeiro. Gradually, as we steamed slowly in towards its narrow entrance, the light of the Santa Cruz fort on the northern side became clearly visible, and several more distant ones brightened and extended themselves. On passing the fort we were hailed, and on there being no response returned, a blue light was burned to ascertain our nature. A little further on, the lights of the mass of the city—the most brilliantly illuminated that I have ever seen—with those of Gloria Hill and Botafogo, burst on our view, with the mountains behind and around lying in

deep shadow—the whole uniting to produce a scene not to be readily effaced from one's memory. We cast anchor at about half-past eleven P.M., and after spending some time in admiring contemplation of the surrounding scene, which was new to the greater number of us, separated for the night.

Next morning, a most brilliant but very hot one, the thermometer +89 in the shade, I spent a long time gazing on the wondrous prospect disclosed on all sides. The atmosphere being very clear, the entire outline of the great harbour could be perceived. In our immediate neighbourhood lay the small island of Villegagnon with its fort, numerous men-of-war, and merchant-vessels of different nationalities, and the town, which, though not particularly attractive on a closer inspection, presents a fine appearance from its remarkable situation, being surrounded on three sides by steep hills, densely clothed with a rich tropical vegetation, of which palms and bananas form conspicuous features. On the opposite side of the bay the towns of Nictheroy and San Domingo stretched for some distance close to the beach. Nearer the entrance of the harbour the Corcovado mountain and the remarkable Sugar Loaf, with their precipitous rock-faces, arrested the eye, while at its head the chain of the Organ mountains closed in the view.

Later in the day a party of us landed, and spent some time inspecting the town, the streets of which, with the exception of the Rua Direita, are for the most part so narrow as not to permit of two vehicles passing one another without seriously encroaching on the footways—a circumstance which, however, does not appear to be productive of any feelings of inconvenience to the coachmen, who drive along utterly regardless

of the safety of any unfortunate pedestrians who may chance to be in their way. Coleridge has immortalised the streets of Cologne as distinguished for the variety of evil odours which they possess, but after having visited both cities, I have no hesitation in affirming that Rio bears away the palm in this respect. We encountered a mixed population in the streets, the negro element being very prevalent, and the heads of the women of that race in general decorated with gaily-coloured turbans. We visited the Passao Publico, or public garden, which is very well kept, and forms a pleasant resort in which to spend a vacant hour, as we often subsequently found, an agreeable shade being afforded by the numerous tropical trees which are cultivated in it. Here we noted palms of many species, silk-cotton trees (*Bombax*), *Pandani*, *Siphoniæ*, *Cycadeaceæ*, beautiful specimens of the traveller's tree (*Ravenala Madagascariensis*), together with a number of handsome shrubs of various genera, and a variety of water-plants. An artificial strip of water was tenanted by a number of water-fowl, embracing swans, geese, and ducks of various species, while on its grassy banks herons were standing thoughtfully on one leg, or slowly stalking along, each step appearing to require a moment's consideration. Overhead, some white pigeons had built their nests among the crown of leaves of a tall palm, and were sitting there in great content. We lingered about the garden till after dusk, when a few fireflies made their appearance, flitting about the plants, and about an hour later we returned to the ship for the night.

The following day, Sunday, some of us went on shore to church in the forenoon, finding the pretty interior of the English Chapel a pleasing contrast to its dirty and noisy surroundings, as, though there are services in the Catholic churches, and a vast and wasteful expenditure of rockets and

other fireworks during the day, Sunday is evidently practically ignored at Rio, the shops being kept open just as on week days, and business going on as usual. There did not even appear to be any of that holiday-keeping for which Sundays in Roman Catholic countries are so famous. In the evening there was a splendid display of phosphorescence on the water, an oar's blade dipped into it emerging every time gleaming with light.*

On the 5th I accompanied three of the officers on a walk to the Botanic Gardens beyond the suburb of Botafogo. On the way out we encountered a good deal of drizzling rain, which, however, was felt to be rather a relief as lessening the extreme heat of the weather. I was greatly delighted with the beauty of the flowers cultivated in the gardens on the outskirts of the town, and I remember being especially fascinated by the splendour of the oleanders and various handsome creepers. Many of the suburban houses have a most inviting appearance, with their walls covered with glazed Dutch tiles to reflect the solar heat, their brilliantly coloured cornices (often bright blue or chocolate colour, with a raised white pattern), and their brown-tiled roofs with projecting eaves; and as a rule the little gardens surrounding them are very judiciously and tastefully laid out, many of them boasting one or two palms or other large trees, under the shade of which their owners may sit and enjoy the "dolce far niente" so much appreciated in tropical countries. Some of the way-side plants were very pretty. Among the most plentiful were a scarlet and yellow *Asclepias*, a little creeper with flowers

* In an interesting and valuable paper on the *Phosphorescence of the Sea* by Dr. E. Giglioli of Florence, late naturalist on board the Italian Frigate "Magenta," to whose kindness I am indebted for a copy of the article in question, the phosphorescence at Rio Janeiro is referred to the well-known *Noctiluca miliaris*.

varying in colour from white or pale lilac to primrose and deep yellow or orange, with a marone heart (*Thunbergia*), and a highly sensitive *Mimosa* with little rounded heads of purple flowers, and short semi-prostrate stems covered with minutely-pinnated leaves. The irritable nature of the last plant revealed itself to one on stooping to pluck a specimen, by the pinnæ of its leaflets immediately folding up on the midribs, and the leaves as a whole becoming rapidly deflexed on the stem. I afterwards found that by stamping smartly on the ground the same effect could be produced, the whole plant collapsing in the most curious way. In some places the ground was covered with this species to the exclusion of any other, and by drawing a stick over a space covered by it, what at first appeared as a green and flourishing patch of vegetation assumed the semblance of a blighted and dying one.

A large and handsome blue butterfly, the first specimen of a species with which we became very familiar in the course of a subsequent visit to Rio, was observed flying along the road, and pursued and captured by two of the party, who afterwards became zealous butterfly-hunters, but was obtained in a too injured condition to be worth preserving. We reached the gardens early in the afternoon, and spent some hours wandering about in them. Though not in that state of good order which one is accustomed to see in European gardens of the same class, they are well worth visiting, possessing much interest for the naturalist, from the wealth of tropical vegetation contained in them. They have been for long justly celebrated for their fine avenue of cabbage-palms (*Oreodoxa oleracea*), which certainly furnishes a remarkable object, although hardly in my opinion a very attractive one, from the stiff nature of the growth of its constituent members, the stems of which appeared to me like tall and slender stone

pillars formed of a number of tiers of masonry, the scars left by the old leaves adding to the effect. In addition to the cabbage-palm, many other species of the order alike from the New and Old World, as well as numerous fine specimens of *Pandani*, the breadfruit, and the jack (*Artocarpus incisa* and *A. integrifolia*), and representatives of many other types, are cultivated. We saw some enormous specimens of the fruit of the jack, two or three times the size of the human head; and the occasional growth from the trunk of a solitary large fruit unassociated with leaves or branches, had a very peculiar aspect. The milky juice exuding from the young twigs was remarkably adhesive, a property frequently met with in plants belonging to the same order. A large wasp was noticed building on several of the trees, from the branches of which the Spanish moss (*Tillandsia usneoides*) depended in festoons. Several insects were captured, among which was a large black bee and a round flattened beetle (*Cyrtonota*) with dark green iridescent elytra spotted with crimson; and a land-shell with a peculiarly shaped mouth (*Bulimus auris-muris*) was met with at the entrance of the gardens.

We returned to the city at the close of the afternoon, on the top of a Gondola Fluminense, a sort of 'bus drawn by mules, numbers of which are constantly running between Rio and places in the neighbourhood. The following year we became very familiar with them, finding them a great benefit when we were returning fatigued to the city after long walks in the heat, and we often admired the excellent driving displayed by the cocheiros in the narrow and roughly-paved streets of the city. As we drove along we enjoyed a series of fine views of the Corcovado and Sugar Loaf, the form of both of which eminences varies very remarkably according to the point from which they are regarded; and our attention was

attracted by numerous clumps of hoary foliage, contrasting remarkably with the greenness of the other trees on the hills, and which I afterwards found were due to the presence of a species of *Cecropia*.

Next day several of us landed after breakfast, and made a short excursion into the Rio Comprido valley, where a number of beautiful though well-known Lepidoptera were captured, as also specimens of a small *Mantis*, one of the curious walking-stick insects (*Phasma*), a *Julus* of considerable size, and a large spider, with a hard horny pale yellow body, marked with rounded black spots, and furnished on the dorsal surface of the abdomen with two horns. Like all those who have visited Brazil, I was greatly struck with the profusion of beautiful insects, with the forms of many of which I had long possessed an acquaintance from the illustrations in various works of natural history. In the valley and neighbourhood I collected a number of species of plants, including a fine passion-flower (*Passiflora*), an *Oxalis* with purplish rose-coloured flowers, a cucurbitaceous plant with small yellow fruits, ripe specimens of which, on being handled, burst open, disclosing the red seeds; some Leguminosæ, and a variety of ferns, some of which, from their peculiarity of habit, would hardly be recognised as members of the group by those persons who merely possess an acquaintance with our British forms.

I may here remark, that although on this and later visits to Brazil I met with many beautiful flowers, my experience on the whole coincides with that of the distinguished traveller and naturalist, Mr. Wallace, who remarks that he is convinced, from his own observations,* "that in the most luxuriant parts of the tropics, flowers are less abundant, on the

* *Malayan Archipelago*, vol. ii. p. 295.

average less showy, and are far less effective in adding colour to the landscape than in temperate climates," and that he has never seen in the tropics "such brilliant masses of colour as even England can show in her furze-clad commons, her heathery mountain-sides, her glades of wild hyacinths, her fields of poppies, her meadows of buttercups and orchises—carpets of yellow, azure-blue, and fiery crimson, which the tropics can rarely exhibit." This, I think, may be partially accounted for, if we take into consideration the fact, that but few of our most brilliantly-coloured flowers occur in the shade of woods, but in comparatively open situations, which, in the tropics, are too much burnt up by the direct rays of the sun to permit of much development of vegetable life, with the exception of certain bulbous and succulent plants (such as *Amaryllidaceæ*, *Cactaceæ*, and *Mesembryaceæ*), which, from their structure, are capable of thriving on very poor soil. The case is, however, entirely different, it is almost needless to observe, as regards animals—the birds, reptiles, and insects on the land; and the fish, molluscs, crustacea, and other invertebrates of the seas of the tropics, being, with few exceptions, much more brilliantly attired than their representatives in temperate climates.

The 7th was a day of heavy rain, in consequence of which I did not leave the ship. The warm steamy atmosphere produced was very unpleasant, and caused a most extensive development of mould on articles made of leather, and specimens of all kinds. A few porpoises were observed swimming about the harbour, and in the evening there was a splendid sunset; the summit of the Corcovado and other peaks forming a sharp contrast with the deep rosy sky behind them.

On the 8th, accompanied by the surgeon and paymaster

(Dr. Campbell and Mr. Bedwell, my associates on most of my excursions), I landed in the morning, and crossed from the city of Rio to the opposite side of the harbour in one of the odd-looking steamers, like Noah's arks, which are constantly plying to and fro. Landing at Nictheroy, we struck into a path leading up a wooded hill, from the summit of which we gained beautiful views of the harbour with its islands. We obtained a number of species of butterflies, some large bees, ants, and spiders, as well as a curious nest of a lepidopterous insect (*Oiketicus*) hanging from a twig. This was about three inches long, of an elongated form, tapering to the free and attached extremities, and was constructed of small pieces of stick, covered with a thin gray papyraceous substance similar to that of which wasps' nests are made, and lined with a very tough woolly material. I ascended a neighbouring hill, the summit of which was crowned with palms, by myself, and was greatly impressed by the luxuriance of the vegetation, noticing, among other objects, a great aloe-plant (*Agave*) growing high up in the fork of a tree. On the way down, there being no path, I lost my way, and not till after a severe struggle through the intricacies of a thicket, where half the plants appeared to be endowed with thorns or prickles, and a species of palm (*Bactris*), the entire stem of which was clothed with black needle-like spines, nearly two inches long, specially abounded, succeeded in emerging from the wood near the edge of the harbour, at a distance of some miles from where I had left my companions.

The two following days were spent in excursions in the same neighbourhood, and a variety of zoological specimens collected, including a batrachian (*Cystignathus ocellatus*), taken in a pool of water; several specimens of a small *Bulimus* (*B. papyraceus*) found in a torpid state on walls; some curious

heteropterous insects, with leaf-like expansions on their legs (*Anisoscelis*); and a large species of spider, which formed geometric webs between the great leaves of an *Agave*, and is probably the same with that obtained in similar situations by Mr. Darwin on his visit to Rio.* On the morning of the 12th, a day of great heat, we moved up from our anchorage to Coal Island to take in a supply of fuel, and a large party took advantage of the opportunity to land on a portion of the mainland in the neighbourhood, which we had not yet visited, and spend the day roaming about the wooded hills. Near the beach many large mango-trees (*Mangifera Indica*) were growing, and cast a delightful deep shade, and the cashew-nut (*Anacardium occidentale*) abounded—its curious fruit in various stages of growth. Many lizards were seen on this as well as on other excursions, but they generally succeeded in eluding capture owing to the extreme rapidity of their motions; and I also caught a momentary glimpse of two snakes in the woods. It was such a perfectly still day that, while resting under the shade of the trees on the side of a hill, the noise made by a wasp scrambling up and down the leaves of an *Agave* close to me was most distinctly audible. Mosquitoes were rather troublesome, but one afforded me some amusement by its persistent efforts to pierce my coat-sleeve—trying first one spot and then another unsuccessfully. I also saw for the first time a butterfly, which on the following year I met with abundantly, the *Ageronia feronia*, which has the curious property of making a crackling sound with its wings as it flies. It is very fond of lighting on the trunks of the trees with its head downwards and wings expanded in a horizontal plane, a habit possessed also by an allied species which appeared to us to have a special predilection for the

* *Naturalist's Voyage*, p. 36.

smooth stems of the cabbage-palm. Not far from the beach was a huge mass of detached rock, on the top of which many cacti and aloes were growing, and on the overhanging sides some wasps were busily engaged building their mud cells. From the roof of a neighbouring well I procured two curious Arachnida with hard spiny bodies, the *Phalangium acanthopus*, of Quoy and Gaimard. As the tide fell, towards the close of the afternoon, a few rocks were left partially uncovered, and I waded out to those in search of marine animals, obtaining fine specimens of *Purpura hæmastoma*, *Littorina flava*, and a species of *Ostræa*, as well as a couple of sponges, one of which was pale violet in colour, and the other deep orange. Many specimens of a species of Isopod, allied to *Ligia oceanica* (probably *L. baudiniana*) were found under the stones in shallow water, and several examples of a crab of the genus *Grapsus* were seen but none taken, as they escaped into clefts of the rock, from whence they could not be dislodged. Among the few Algæ observed, was the widely-distributed *Codium tomentosum*, which I afterwards met with in the Strait of Magellan.

Next morning several of the officers landed on a small island in the vicinity, and one of them brought me from thence a very fine specimen of a swimming-crab (*Lupa spinimana*), which must be tolerably common, as the following year I noticed the species in the Rio market. On the afternoon of the same day we steamed out of the harbour, passing not far from the precipitous island of Redonda, and thereby gaining a good view of the general aspect of its vegetation, which appears to consist principally of palms. The following morning, there being a good north-easterly wind, the screw was got up, and we proceeded under sail. In the afternoon a large whale made its appearance in our immediate vicinity, displaying its dorsal fin and purplish-brown back. The wind continued

favourable until the evening, when between 9 and 10 P.M. it suddenly shifted to N.W., dying away to northward on the morning of the 15th, and soon after springing up from the S.W. Sail was accordingly shortened, and the screw again brought into requisition, the breeze meanwhile freshening with such rapidity, that by the afternoon it was blowing hard, with heavy squalls and a heavy sea from the southward, so that we laboured on under steam, the vessel rolling and pitching violently. The gale continued during the next two days, accompanied with thick, gloomy, drizzling weather, and a few large albatrosses and many stormy petrels were seen; but by the morning of the 18th it ceased, and was succeeded by a favourable wind, which permitted us to proceed under sail alone. We took advantage of this circumstance to employ the towing-net, by which we procured some specimens of a bright blue Isopodous crustacean, the *Idotea annulata* of Dana. Mr. Spence Bate, to whose kindness I am indebted for information regarding this and other species of crustacea submitted to him, remarks that the blue colour appears to be a peculiarity of pelagic species,* and mentions that he has received specimens of the same animal "from Dr. Wallich," who says, "it is a parasite on *Physalia*, almost invariably attached to the float," and that Dr. Wallich's specimens were taken between the Bay of Bengal and the Cape of Good Hope, while those on which Dana founded the species were taken in the Antarctic seas, south of New Holland. The *Idotea annulata*, therefore, enjoys a wide geographical range. I took it again the next season to the south of the river Plate; and I may remark, that I never found it associated with *Physalia*, or any other oceanic hydrozoon.

* Our commonest British species, which is to be met with plentifully on stones and among fuci at low water, is of a dull greenish hue.

We kept a fair wind during the 19th, but the barometer fell rapidly and steadily, which, together with a gloomy, murky state of the atmosphere, excited apprehensions, only too soon to be justified, that a second gale was brewing. In the course of the evening the wind freshened considerably, and some hours later it shifted to the north and westward, and rain fell in torrents. By 7 A.M. on the 20th it was west, and steadily increased in force, accompanied by a falling barometer. It soon became clear that we were in for one of the Pamperos for which the Plate and its vicinity have been so long celebrated, and which owe their name to the circumstance of their blowing from off the Pampas or plains. All due preparations in the way of shortening and reefing sail were therefore made for the enemy ; but these I do not feel myself competent to describe, and shall therefore not enter into. The wind increased with great rapidity, the force in the forenoon averaging 6-9 and in the afternoon 8-10, the vessel meanwhile rolling beyond the extent (30°) registered by the indicator, and causing serious apprehensions to be entertained for the safety of the steam-cutter, which, despite the very considerable elevation at which she was suspended, was several times dipped beneath the waves. I retain a lively remembrance of the pursuit of dinner under difficulties that day, for, it being impossible to sit at table, the greater number of us were established on the floor of the wardroom, jammed up into corners as well as we could manage, with our plates on our knees. It continued to blow furiously throughout the evening ; and about 9 P.M. steam was got up, and the screw lowered for the purpose of easing the ship. At 10 P.M. the barometer had sunk to 29°10′69″, but soon after began to rise, rising as rapidly as it fell. There was, however, no perceptible decrease, but rather the contrary, in

the force of the wind, which raged with violence throughout the night, at one time blowing 11, while the ship rolled 30° in each direction. By the afternoon of next day, however, it appeared to have expended itself, and gradually fell, being succeeded by a beautiful calm night; and on the morning of the 22d it was calm, so that the sails were taken in, and we went on under steam alone.* On that day, which was very fine, a number of albatrosses, which had been our companions during the gale, were no longer to be seen; and the influence of the muddy waters of the Rio de la Plata was indicated by the transition in the colour of the sea from deep blue to dull green.

On the 23d land was reported soon after sunrise. As we steamed up the estuary of the Plate, the low land on the northern shore, between Maldonado and Monte Video, brought to my remembrance my first sight of the Dutch coast, to which it bears a considerable resemblance in respect of its sand-dunes, with the low-lying, mostly treeless country beyond them, dotted here and there with windmills. A large wasp flew on board in an exhausted condition, and about the same time the rigging of the ship became covered with immense quantities of cobweb. Everywhere long delicate threads could be seen streaming out into the air, and a considerable number of their constructor, a minute reddish-brown spider, were to be observed associated with them. This curious phenomenon is of frequent occurrence in the Plate on a fine day after stormy weather. We witnessed it again in the same locality in the following season, and Mr. Darwin has given an interesting account of it in his delightful

* For various of these details I am indebted to Captain Mayne's private journal; that gentleman having, as I have mentioned in the preface, most kindly placed his journal at my disposal.

Naturalist's Voyage. He there remarks that one day (November 1st, 1832) he had paid particular attention to the subject. "The weather had been fine and calm, and in the evening the air was full of patches of the flocculent web, as on an autumnal day in England. The ship was sixty miles distant from the land, in the direction of a steady, though light breeze. Vast numbers of a small spider, about one-tenth of an inch in length, and of a dusky-red colour, were attached to the webs. There must have been, I should suppose, some thousands on the ship. The little spider, when first coming in contact with the rigging, was always seated on a single thread, and not on the flocculent mass. This latter seems merely to be produced by the entanglement of the single threads. The spiders were all of one species, but of both sexes, together with young ones. These latter were distinguished by their smaller size and more dusky colour." "The little aëronaut, as soon as it arrived on board, was very active, running about, sometimes letting itself fall, and then re-ascending the same thread, sometimes employing itself in making a small and very irregular mesh in the corners between the ropes. It could run with facility upon the surface of water. When disturbed, it lifted up its front legs in the attitude of attention. On its first arrival it appeared very thirsty, and, with exserted maxillæ, drank eagerly of drops of water. This same circumstance has been observed by Strack; may it not be in consequence of the little insect having passed through a dry and airless atmosphere? Its stock of web seemed inexhaustible. While watching some that were suspended by a single thread, I several times observed that the slightest breath bore them away out of sight in a horizontal line. On another occasion (25th), under similar circumstances, I repeatedly observed

the same kind of small spider, either when placed or having crawled on some little eminence, elevate its abdomen, send forth a thread, and then sail away horizontally, but with a rapidity which was quite unaccountable. I thought I could perceive that the spider, before performing the above preparatory steps, connected its legs together with the most delicate threads; but I am not sure whether this observation was correct."

After communicating with H.M.S. "Narcissus," the flagship on the station, which, on account of her size, was obliged to lie about two miles out from Monte Video, we steamed up to the inner roads, and anchored not far from the town, which, built on a rising ground, presents rather a fine appearance from the harbour, the towers and dome of the cathedral forming prominent features of its aspect. In the evening a party of us landed, and spent some hours on shore scrutinising the town, which, constructed in the Spanish style so prevalent in South America—namely, in rectangular blocks—struck us as contrasting very favourably with Rio as regarded the width and cleanness of its streets, which intersect each other at right angles. There also appeared to be a much larger proportion of good dwelling-houses and shops, the population seemed to be of a more respectable nature, and there was an entire absence of the negro element, so conspicuous in the Brazilian capital. In the course of our stroll, which was much appreciated after our late experiences at sea, we were amused by noticing a lamplighter's dog accompanying his master with a stick in his mouth, at each end of which was a lighted lantern. We visited the cathedral, which occupies a portion of one side of a square planted with paradise-trees, which furnish a grateful shade during the heat of the day, and came to the conclusion that, with the

exception of the marble steps in front of the entrance, it had little but size to recommend it. The exterior of the dome is covered throughout the greater part of its extent with blue glazed tiles, causing it to appear as if constructed of china; and stucco largely prevails in the interior. The architecture is altogether of a very inferior description, the painted windows are very gaudy, and, like nearly all the South American churches which I subsequently visited, there is a profusion of tawdry gilt and tinsel images of our Saviour, the Virgin, John the Baptist, etc.

On the 24th, a day of brilliant sunshine and great heat (the thermometer +87 in the shade), in the morning two of the officers with myself, landed after breakfast, and set out on a walk into the country. It took us long to get fairly beyond the town, which straggles out for a very considerable distance, and after that we pursued our way for some miles along a broad dusty road, flanked on either side with gardens, hedged with aloe (*Agave*) and cactus plants, and guarded in general by large and fierce dogs, on the watch to repel all intruders. Many of the Agaves were in bloom, and their gigantic flower-stems, from twelve to twenty feet high, with their symmetrically-arranged horizontal branches, covered with greenish-yellow flowers, communicated a most peculiar character to the landscape. The young flower-stem, before the branches manifest themselves, is a Brobdignagian representation of an asparagus-shoot as it comes to table. Split lengthways into slices, the central part of it is employed for razor-strops and a variety of other purposes. In the absence of cork, it is a useful substance for lining entomological boxes, its soft pith-like nature readily admitting of penetration by a pin's point. On the great fleshy leaves, varying in length from three to six feet, a species of *Helix*, as plentiful as our

common garden-snail (*H. aspersa*), was feeding. This species, I was afterwards informed, was not an indigenous one, but introduced, I rather think accidentally, from the Mediterranean. Along the sides of the road I met with our common red pimpernel (*Anagallis arvensis*), a species of *Oxalis* with pretty rose-coloured flowers, a white Orchid, and a few ferns, including an *Adiantum*. The pastures in many places were in a blaze of purple with a species of *Echium*, and on uncultivated portions of the plains a great thistle (*Cynara*), with large bluish-purple flowers, and attaining a height of from three to six feet, was everywhere abundant. We also observed numerous brilliant patches of scarlet and purple *Verbenas*, together with a variety of Leguminosæ, Compositæ, etc. A considerable number of birds, including one or two species of hawks, swallows, a fly-catcher with a deeply-forked tail, and some gray plovers, were seen; and a few species of Lepidoptera and Coleoptera obtained. From the branches of some willows we found hanging numerous specimens of a curious insect-nest, like that which I have mentioned as seen at Rio, but on a smaller scale, and I almost trod on a brown snake, but did not succeed in securing it. In the course of our walk, many Gauchos cantered past us on their horses, and attracted our attention by the singularly picturesque appearance which they presented, with their dark, swarthy, bearded and moustached faces, and brightly-coloured ponchos.

Two days later I formed one of a number who took a long ride into the country. Riding is certainly not the most favourable method of prosecuting observations in natural history, nevertheless I noticed a variety of objects that were new to me, seeing for the first time a little burrowing owl (*Pholeoptynx cunicularius*), and the Teru-tero, or spur-winged

lapwing (*Vanellus cayanus*), which appears to be widely distributed over South America, as I met with it later in the Strait of Magellan, and I believe it also occurs in Brazil. Like its British representative, it occasionally proves very troublesome, flying around the pedestrian and frequently uttering its harsh cry. We stopped at noon at a posada to get some country wine, and while we were there a couple of gauchos, very handsome fellows, came in to refresh themselves. At the belt of each, in a sheath, was a sharp dagger-like knife, which upon examination proved, to our amusement, to be of Sheffield manufacture.

On the afternoon of the 29th I took a stroll of a few miles out of the town, along the sea-coast, in the direction of Maldonado. On the rocks, above high-water mark, I found a variety of plants in flower, such as a pretty white *Petunia*, frequently forming fine masses of white, a *Matricaria*, and a species of *Medicago*. I spent a good deal of time watching with much interest the operations of some ants busily engaged in gathering up stores, and carrying such loads as often entirely to conceal their bodies. Some were carrying the spirally-twisted pods of the *Medicago*, while others bore away the heads of flowers of the chamomile, disappearing with them into the holes leading to their subterranean habitations, for their dwellings were not in ant-hills. I noticed that almost invariably there was a circular hard space of ground around the entrances, I suppose worn by their incessant peregrinations. A beautiful bright green lizard with a long tail was very common, but so fleet that I did not succeed in catching any, and many specimens of the Painted Lady butterfly (*Cynthia cardui*), which I afterwards discovered both in Brazil and Chili, were flying about the flowers. The beach was singularly destitute of life, a small crab (*Cyrto-*

grapsus angulatus), which was common in pools in the rocks, being almost the only marine animal obtained. The heat was very great, and the air tainted with the putrefying carcases of mules, horses, etc., lying about unburied, with many huge black pigs prowling about in their vicinity.

The following day was chiefly distinguished by a rather unpleasant adventure. A number of us who had spent the afternoon on shore being caught in a pampero on our way back to the ship, and reaching it with much difficulty, drenched to the skin. One of the great drawbacks to Monte Video is, certainly, the prevalence of these gales ; and, as Captain Mayne remarks in his Journal, one of its worst features is, that there is not a safe pier in the harbour when there is any wind.

On the 3d of December I accompanied two of the officers, who were appointed to take a set of magnetic observations, to the foot of the Mount, an eminence nearly 500 feet high, from which the city of Monte Video derives its name. While my companions were engaged in their work, I took a ramble over the hill, the greater part of which was of a splendid purple tint, from the profusion of the *Echium* I have already mentioned, which covered it. Near the summit I found specimens of a blue and yellow lupine, a red and a yellow *Oxalis*, a pink-flowered prostrate *Mimosa*, and an *Echino-cactus*, with straw-coloured flowers. I carried with me on this occasion two tin japanned vascula, which caused my employment to be somewhat misconstrued by various of the country people, near whose dwellings I passed, at they assailed me with cries of " Que vende, que vende ?"

CHAPTER III.

MALDONADO — BOTANY — ORNITHOLOGY — AMPULLARIA — VOLUTA — PEJE REY — CAPTURE OF TERRESTRIAL AND FRESHWATER BEETLES IN THE TOWING-NET — SYCOZOA — ENTOMOSTRACA — MACROCYSTIS: ITS GROWTH, DISTRIBUTION, ETC. — ENTER THE STRAIT OF MAGELLAN — ARRIVE AT THE CHILIAN SETTLEMENT OF PUNTA ARENAS OR SANDY POINT — CLIMATE — PRODUCTS — PLANTS GROWING NEAR THE BEACH — TAME GUANACOS — CENTRITES NIGER — SENECIO CANDIDANS — SEROLIS — LITHODES — PARROQUETS — CUTTLE-FISH — ANTARCTIC AND EVERGREEN BEECHES — WINTER'S BARK — WOODPECKERS — COLEOPTERA — MYXINE — ANEMONE DECAPETALA — MYZODENDRON — CYTTARIA — BARBERRIES — TINNUNCULUS SPARVERIUS — SNIPE — CYSTOPTERIS FRAGILIS — LARGE OWL — STEAMER-DUCK: NOTICES OF, BY OLD NAVIGATORS; HABITS, ETC. — LARGE CYANÆA — PELTARION — HALICARCINUS.

LATE on the evening of the 6th December we left Monte Video, and proceeding under steam we reached Maldonado, on the north bank of the Plate, near the entrance of the estuary, before breakfast next morning. Here it was determined that we should remain for the day, as Captain Mayne was anxious to obtain sights before proceeding on the southerly voyage. A party of us, taking advantage of the opportunity presented of seeing something of the surrounding country, left the ship after breakfast, and after we had accomplished a landing with some difficulty through the surf which was breaking on the shelving sandy beach, set out in search of a lake at some distance, where the sportsmen of the party had been informed waterfowl were frequently to be procured in

considerable numbers. Our way lay for some miles over low-lying, sandy, undulating plains, which presented so many attractions for me in the botanical line, that my companions soon distanced me, and I strolled along in solitude, filling the large vasculum which was my constant companion in the cooler parts of South America. Among the plants I met with on this occasion were several yellow-flowered species of *Compositæ*, the white *Petunia* observed at Monte Video, a yellow *Œnothera*, a pale pink *Convolvulus*, a curious dwarf leafless (probably Rhamnaceous) shrub, which had phylloid branches profusely armed with formidable spines and bearing tricoccous fruits ; some sand-binding grasses, and a dwarf Myrtaceous plant, the white flowers of which presented a very attractive appearance. These, together with a species of *Dyckia*, and many other forms, all occurred in very arid soil ; while some marshes which I passed yielded a variety of other plants, among which I may instance a sundew (*Drosera*), several Leguminosæ, a plant unknown to me with pinkish-white flowers, fringed like those of our British bog-bean, but with undivided leaves ; a small yellow-flowered *Utricularia;* a fern (*Lomaria Boryana*) with a short thick stem (six inches to a foot high, surmounted by a crown of very tough leathery fronds ; and a composite plant resembling a *Senecio*, with a flower-stem six to eight feet in height, on the branches of which flocks of small finches were sitting. I noticed a number of species of birds, including the burrowing owl already referred to, which was very tame, flying about in my vicinity, and perching on the bushes, making a curious thrumming sound. Another remarkable sound which I heard, and which for a time perplexed me from its subterranean character, was produced by a burrowing rodent, the tucu-tuco (*Ctenomys Brasiliensis*), which tunnels the sandy soil in all

directions. A few Coleoptera were picked up, but insect life did not appear to be abundant. I overtook the sportsmen before they reached the lake, and while we halted for luncheon inspected their spoils, which consisted of two species of Falconidæ, one of them a handsome harrier (the *Circus macropterus*); some fly-catchers, including a species with a very long tail; the *Xanthornus flavus*, many of which we saw flying about, a turtle-dove, and a young partridge (*Nothura major?*). Pursuing our way for some distance farther, we at length reached the lake, the edges of which were defined by a broad belt of tall-growing rushes. Here but few birds were either seen or obtained (a brownish-black *Ibis*, a single specimen of which was shot, is the only species recorded in my journal); but by dint of wading about among the reeds, I succeeded in procuring a few additional botanical treasures, including another species of *Utricularia*, a *Riccia*, etc., as well as some dead shells of a large species of *Ampullaria* (*A. fasciata*), together with clusters of its beautiful rose-coloured eggs attached to the rushes. Not far from the lake, on some sandy ground, I also met with a *Solanum* (I rather think one of the numerous wild forms of our potato, *S. tuberosum*), and a Malvaceous plant, with prostrate stems and beautiful purple-hearted flowers. As the afternoon was now wearing on, we decided on "making tracks" homewards, and descended to the beach after a while. Numbers of dead shells were lying about, but, for the most part, much worn and broken. I, however, picked up a tolerable specimen of the *Voluta colocynthis*, which appears to be not uncommon about Maldonado, as numerous live specimens were subsequently procured there by the officers of H.M.S. "Narcissus," several of whom were gifted with strong natural-history tastes. I also found the cranium of a large seal (probably a species of *Otaria*) lying above high-water mark.

On our arrival on board we found that a seining-party which had been despatched early in the afternoon had succeeded in procuring a haul of two species of fish. A seal had been also taken in the net, but managed to effect its escape. One of the kinds of fish, a beautiful creature about a foot long, presenting a vague resemblance to an exaggerated smelt, with a broad silver stripe along each side, was the "peje rey" (*Atherinichthys Argentinensis*), long known as an inhabitant of the Plate, and justly esteemed for its delicacy of flavour, to which it appears to owe its Spanish name of "king fish."* Falkner, a Jesuit missionary in South America in the eighteenth century, thus describes it in his interesting account of Patagonia, "and the adjoining parts of South America :"—"The pequareys, or king's fish (so called by the Spaniards), are a kind of smelt or sparling ; in colour, shape, and taste, resembling ours, except that the head is very large, and the mouth very wide. Their size is about that of a mackerel. They never frequent salt water ; but are in great quantities in the River of Plata. When the Parana increases, in the month of July, they go up the river in vast shoals, a little above Santa Fe, to leave their spawn in the lesser rivers which enter the Parana. The fishermen catch them with hooks, in great quantities, cut them open, and dry them, and sell them to the neighbouring cities. They are of an excellent taste, and their flesh is very white, without any fat ; when fresh their flesh is considered as a great dainty. They must be dried without salt, as it would immediately consume them ; and if they get any wet or moisture, where they are hung out to dry, they will corrupt."

A remarkable oval semi-transparent body about the size

* An allied species (*A. microlepidotus*), common at the mouths of rivers in Chili, bears the same popular cognomen.

of a turtle's egg was brought to me by one of the crew of the seining-party, and for some time I was in doubt as to its true nature. It turned out to be the peculiar nidus of a mollusc, the *Buccinum deforme* of King, who found specimens of it on the sea-beach of Gorriti, a small island in the bay of Maldonado. He states that in the month of January the eggs were obtained in all stages of growth.

We left Maldonado at 11 P.M. that night, not sorry that there were no more halting-places between us and our destination, to which a romantic interest was attached in the minds of many of us, from the accounts we had read of the tempestuous weather and majestic scenery to be encountered therein.

Next day was beautifully bright with a favourable wind, an auspicious beginning to the last stage of our voyage. My time was fully taken up in skinning birds, and placing the plants collected the day before in drying paper. Things in general went on in the same quiet routine, so characteristic of fine weather at sea, and the only fact worth recording was the arrival of a large and handsome sphinx-moth.

Sunday, the 9th, also passed very quietly, and enabled us to get the full enjoyment of a quiet Sunday at sea. We had a fine view of the Magellanic clouds in the evening, and there was a magnificent display of phosphorescence on the water, the crests of all the small waves in every direction being brilliantly illuminated.

The 10th was also a bright day during the greater part of it. My time was well filled up with writing journal and sorting specimens. A wonderful amount of time, as I daresay all who have had a like experience with myself will bear me witness, is occupied in stowing and unstowing books, apparatus, etc., when you have little space and much to cram

into it; at the same time, it is certainly wonderful how much can be accommodated in a cabin six feet square, with a due amount of consideration. After a time I used regularly to devote a portion of the day preceding that on which we left harbour to wedging up everything movable, otherwise one had a considerable chance of being buried alive in a chaos of books, dried plants, and animals preserved in spirit. Towards sunset the atmosphere became foggy, and later in the evening I was surprised by finding some live beetles in the towing-net. Some of these were terrestrial, and others fluviatile forms; and as I was greatly interested by the peculiarity of the circumstance, I applied to my friend Mr. Gray (the principal navigating officer) for information as to our exact position with relation to the land. An examination of the chart revealed that we were forty miles off Cape Corrientes on the Argentine coast, and on subsequently turning to Mr. Darwin's Journal, I found that he had observed the same phenomenon in the same latitude, *i.e.* seventeen miles off Cape Corrientes. He remarks that those specimens which he preserved belonged to the genera *Colymbetes*, *Hydroporus*, *Notaphus*, *Cynucus*, *Adimonia*, and *Scarabæus*, and that he at first thought they had been blown from the shore, but that on reflecting that of the eight species which were obtained, four were aquatic, and two others partly so, it appeared more probable that they had been carried into the sea by a small stream which drains a lake near Cape Corrientes. I am informed by Mr. C. Waterhouse of the British Museum, who has kindly furnished me with the names of some of the Coleoptera which I collected, that among those taken in the towing-net on this occasion are a *Pœcilus*, a *Colymbetes*, a *Philhydrus*, a *Coccinella*, and the *Eriops connexa*. It is not a little curious that two observations so

identical in character should have been made in nearly the same locality at an interval of more than thirty years from each other.

On the 11th, in the morning watch, we encountered a squall, accompanied by thunder and lightning. Many specimens of that beautiful petrel, the Cape pigeon (*Daption capense*), were observed for the first time; and, in the forenoon, a large mass of floating weed was seen in the distance. In the afternoon, when we were 120 miles off the nearest land, a large dragon-fly flew on board and was captured. In the evening it became almost dead calm, though the vessel still slipped slowly through the water. A fine sunset, accompanied by a frosty haze on the horizon, ushered in a night of exquisite beauty. At this time we all began to perceive a steady decrease in the temperature, the evenings, which, while we were in the Plate, had been very oppressive, now feeling quite chilly.

The morning of the 12th dawned calm and bright, the air being delightfully fresh and exhilarating. In the forenoon we observed great numbers of small moths floating on the almost rippleless surface of the water; and early in the afternoon I obtained in the towing-net some curious gelatinous bodies, of a pyriform shape and firm consistence, marked with rows of small yellowish-white appendages. These, which I preserved in spirit, I then believed to be Tunicata, allied to *Pyrosoma;* but it was only during the present year (1870) that an examination of the specimens (now at the British Museum) proved that my conjecture was correct, the animals turning out to be the remarkable *Sycozoa sigillinoides* described and figured by Lesson in the *Voyage de la Coquille*, but not noticed in any other work that I have met with. Lesson remarks that his specimens were found

"flottant par un beau jour de calme, en Decembre 1822, à trente lieues au sud de la Terre-des-Etats,* par 53 degres de latitude australe, dans le voisinage du Cap Horn;" and remarks that this genus (*Sycozoa*) has for its type an aggregate "d'animaux biforés, logés dans un corps pyriforme, au plutot imitant une figue," and that the animals thus situated are very small, rounded, oblong, and dilated at their posterior extremity, and arranged in regular vertical rows in the mass. Later on the same day more Coleoptera were taken in the net.

On the 13th I found some small Crustacea in the towing-net. These consisted of two species of Amphipods and an Entomostracan, to all appearance identical with the *Cypridina gibbosa* of Dana, described from specimens taken in the Pacific, in lat. 15° 20′ S., long. 148° W. This little creature, of which several examples were taken, in general lay at rest at the bottom of the water of the vessel in which it was placed, but, on being disturbed, came up to the surface and swam rapidly about.

The following day was bright and clear, but the wind, which had again sprung up, was unfortunately not fair, so that we were unable to keep on our course, and tacked westwards in towards the land; but towards afternoon it again fell, and there was a nearly dead calm for the rest of the day. Some albatrosses and a tern were the only signs of life to be seen.

On the 15th we made but little way, as the wind was very uncertain in its direction and continuance, and we were kept much off our course. There was a slight improvement in the state of matters on the 16th. On the evening of that day, while a number of us were on deck, a large mass of floating weed was observed passing the vessel, and, on being

* Staten Land.

hooked, proved to be a specimen of the far-famed "kelp" (*Macrocystis pyrifera*), with which we subsequently became very familiar. It was a plant about eighteen feet long, with a large branching root, in the crevices of which a variety of small *Ophiocomæ*, *Annelids*, *Tunicata*, and other minute marine animals had taken up their abode, while the fronds were loaded with thousands of fine specimens of a pedunculated Cirriped (*Lepas australis*), widely distributed in the southern seas. We placed a few specimens of the *Lepas* in a tumbler of sea-water, and it was interesting to watch them bending and twisting their peduncles, and thrusting out and again withdrawing their cirri within the valves of the shell. That portion of the viscera not included in the test appeared of an exquisite blue colour as seen through the integument, and the peduncle, as a whole, was also more or less tinged with the same tint. This fine blue, however, soon changed to a dull pink when the animal was placed in spirit.

Although much has been written on the "kelp," it would, I think, be unpardonable to pass over this wonderful seaweed, one of the most striking phenomena of vegetable life in the southern temperate and antarctic latitudes, without a more extended notice, as some of my readers may probably be unacquainted with it; and in doing so I shall avail myself largely of the excellent and comprehensive resumé of the history of the plant given by Dr. Hooker in the *Flora Antarctica*. Dr. Hooker there observes that "the *Macrocystis* is so conspicuous, and from its wandering habits often occurs so unexpectedly, that the attention of our earliest voyagers has been directed to it, and we are consequently led back by our inquiries into its first discovery, to the annals of those perils and privations which have ever marked the progress of discovery or enterprise in the stormy seas of the south." He

proceeds to remark, that the "first notice of the *Macrocystis* with which we are acquainted, is of so early date as the middle of the sixteenth century, and occurs in a copy of sailing directions for mariners, with the title, 'A Ruttier from the River Plate to the Streight of Magelana,' and forms part of 'A special note concerning the currents of the sea between the Cape of Buena Esperanza and the coast of Brazilia, given by a French pilot before Sir John Yorke, Knt., before Sebastian Cabote, which pilot had frequented the shores of Brazilia eighteen voyages.'—Hakluyt, ed. 2, vol. iv. p. 219. In describing the above-mentioned route, after passing Cape Sta. Martha, the trusty pilot's direction to the mariner is, 'to goe S.W. by W. until he be in forty degrees, where he shall find great store of weedes, which come from the coast:' and again, in pursuing the voyage, after entering the Straits, 'If you see beds of weede, take heed of them, and keep off from them.'"

This wonderful plant, the most gigantic Alga known, exists in vast beds around the coasts of Patagonia, Tierra del Fuego, and the Falkland Islands, in general growing in depths of from six to twenty fathoms, and is of the greatest service to the navigator as an indication of the presence of rocks to be avoided by him. From a branching root, in the intricacies of which small Molluscs, Crustacea, Echinoderms, and Annelids nestle, arise small fructiferous bladderless submerged fronds, and long slender stems, which reach the surface of the water, and there give off hundreds of elongated elegantly-shaped, jagged-edged fronds, varying in length from four to six inches to one or two feet, each provided with a pyriform air-vesicle at the base. These fronds, derived from one another by a process of vertical splitting, spread out on the surface of the water like so many banners, the manner in which

they are directed being an infallible index of the ebb and flow of the tide, and I know few more beautiful sights to be witnessed, than by leaning over the gunwale of a boat on a calm day, and gazing through the clear depths of these submarine forests, in which fish swim about as birds fly through the trees of a wood. It is difficult to fix a limit to the dimensions to which these floating masses of kelp may extend. The distinguished botanist from whom I have already quoted, states, that "in Kerguelen's Land the length of some pieces, which grew in the middle of Christmas Harbour, was estimated at more than 300 feet; but by far the largest seen, during the Antarctic Expedition, were amongst the first of any extraordinary length which the ships encountered, and they were not particularly noticed, from the belief that the report of upwards of 1000 feet of length was true; or, at any rate, that better opportunities would arise in the course of a three years' voyage, than the first week of our explorations could afford. These occurred in a strait between two of the largest islands, where, far from either shore, in what is believed to be forty fathoms water, somewhat isolated stems of *Macrocystis* rose at an angle of 45° from the bottom, and streamed along the surface for a distance certainly equal to several times the length of the *Erebus;* data which, if correct (and we believe them so), give the total length of the stems as about 700 feet."

Although probably the "kelp" has attracted a greater share of the attention of voyagers in the Strait of Magellan and on the coasts of Fuegia than elsewhere, in consequence of being regarded as a salutary warning of hidden dangers, it is by no means limited (as indeed the preceding extract shows) to the southern extremity of the South American continent. Of the wide extent of its geographical

range, greater "than that of any of the larger *Algæ*," the reader will be able to judge from the following account, also from the pen of Dr. Hooker:—"The *Macrocystis* girds the globe in the southern temperate zone, but not in the tropics or northern hemisphere, and this is a most curious trait in its history. We may first, however, trace the southern edge of the belt which it forms, and we are the better enabled to do so, because the limits of its existence as a floating plant were observed in six different longitudes in the passage of the Antarctic Expedition as often between the Southern Sea and the southern ice, within which there is no vegetation. The southern boundary of the *Macrocystis* sea is very much determined by the position of the ice, and the northern by the currents and temperature of the water. Thus, in the longitude of New Zealand, where open sea extends to the 65th degree, this plant is found as far as 64°, the specimens having probably been drifted originally from Kerguelen's Land or the Crozets, which are the great nurseries for it in the eastern hemisphere, and from whence all these drifting islets have been wafted which occur between their longitude and Cape Horn. In the longitude of Cape Horn, 58° or 60° is the highest parallel it attains, for it has not been found among the South Shetlands. Farther east, in the South Atlantic, its parallel is probably still lower, till in the meridian of the Cape of Good Hope it is 40° removed from the Pole, being no farther south than 50° 30′. There the Atlantic Ocean specimens are derived from the southern extreme of America and the neighbouring islands. Its northern range, on the other hand, is dependent—1st, on the temperature of the ocean, for it neither enters the tropics or the Atlantic, nor passes up the shores of Africa or into the Indian Ocean; whilst it does inhabit the whole surface of the Pacific Ocean

and the west coast of both Americas ; 2dly, on the currents, for when north of the influence of the uniform westerly movement of the waters in the Antarctic Ocean, it is deflected with their courses, and carried, while temperature allows, to whatever seas receive these waters. Thus, the South Polar current divides at Cape Horn, one portion following the west coast of South America to Cape Blanco and the Galapagos Islands under the equator, conveying the *Macrocystis* with it, which then enters the cold waters which flow from the Arctic Islands of the Pacific, and over whose entire surface it is spread, reaching Kamtschatka, New California, and the Aleutian Islands ; so that in the longitude of Western America the *Macrocystis* ranges from the Arctic to the Antarctic Circle. The eastern branch of the Cape Horn current passes between the Falkland Island and Fuegia, conveying vast masses of this seaweed 200 miles north of the Falklands, as low as the 44th degree, and some even reaching the Plate river in 35°, its northern limits in the Western Atlantic. Farther west in the Antarctic Ocean its distribution is less known ; but, since it does not occur far north of the Cape of Good Hope in that meridian, we may conclude that it ceases about the 34th degree. With regard to the South African habitat, it is difficult to account for so vast a quantity as the Agulhas Bank exhibits, for these waters, 130 miles in breadth, flowing with a rapid stream from the N.E. or Indian Ocean, literally swarm with *Macrocystis*, which possibly is taken up from the westerly Polar current (which flows along the parallel of 45° S.) by the Indian (or N.E.) current in question."

It is, perhaps, hardly necessary to remark, after the preceding observations, that "kelp" continues to grow long after it is detached from its parent bed; and I need not say

that one of the most important qualifications of the "look-out" in vessels in the dangerous regions where it prevails is to be able to distinguish floating from rooted specimens of the plant.

On the 17th, the water having assumed a muddy appearance, I examined a small portion with the microscope, but could not detect anything with the exception of numerous grains of sand. The forenoon of the following day was bright and sunny, and we had a capital breeze, which allowed us to make from eight to nine knots an hour. During the afternoon, however, the barometer fell very rapidly, and the sky presenting a most threatening aspect, sail was shortened at about 5 P.M., and preparations made for a gale, which, however, did not take place, the clouds discharging themselves in heavy rain, which lasted for some time, and was succeeded by a red, stormy sunset.

The 19th was also a bright bracing day, making us experience the physical pleasure of existence, which is not so easy of attainment in the tropics. Towards evening the weather again assumed an unpropitious aspect, the heavens becoming covered with most remarkable masses of heavy cloud, with here and there intervals of pale mild green sky. At length, just as the sun was going down, a squall came on, and the scene that ensued while the vessel tore through the perturbed water, was of the most weird and striking character, for along the horizon stretched a broad brilliant orange belt of sky, banded above by heavy black clouds, and across it and the setting sun a thin veil of falling rain extended. At the close of the squall, which did not last long, the orange colour was succeeded by a splendid green hue.

On the 20th, a fine day but the wind foul, so that we were much off our course, a number of small grayish-white

birds, apparently a species of petrel, were observed in the vicinity of the ship, flying close to the water, moving their wings rapidly, and then sailing along for a short space. We altered course early in the afternoon, and shortly after got up steam, as we hoped to enter the Strait next day. The following morning was fine, bright, and cold. In the forenoon land was sighted, the steep cliffs of Cape Virgins, on the northern side of the entrance of the Strait being recognised at a distance of about twenty miles, and not long after the long gravel-spit of Dungeness could be distinguished. The land at first presented a far from interesting appearance, resembling a long low black wall, sloping down into the water at one end. As we gradually approached the Cape, it assumed a variety of forms, a phenomenon due to a species of mirage produced by irregular refraction, and which we often subsequently observed strikingly manifested in the eastern portion of the Strait—distant mountain-peaks which in the ordinary condition of the atmosphere were invisible, being thrown up against the sky, and the forms of small islands, boats, and live objects, most singularly distorted.

We entered the celebrated Strait, the scene of our future labours for the next three years, early in the afternoon, with what wind there was ahead and a strong tide running against us, so that for some time we could only make between four and five knots an hour. In the eastern portion of the Strait, I may here observe, the state of the tide demands the careful attention of the navigator, on account of the extent of the rise and fall, and the force of the ebb and flow, which at one narrow part (the First Narrows, see map) varies from five to eight knots, so as to be either a great help or an almost insuperable obstacle to progression. As we steamed slowly on our way, a variety of well-marked

points, such as Mount Aymond, the Asses' Ears, Mount Dinero, Cape Possession, and Direction Hills, on the Patagonian, and Mount Orange on the Fuegian side, were eagerly and carefully noted, and, at the same time, a line of soundings was taken for future use. I examined the soundings thus obtained, but the only substances to be observed were portions of fine black mud, with fragments of the shells of molluscs and barnacles, the latter of which (*Balanus lævis*), which is very abundant in the Strait, were specially prevalent. The afternoon was cold, cloudy, and drizzling, though here and there parts of the Patagonian coast were lighted up with sunshine. Towards the latter part of the afternoon the tide turned in our favour, so that we progressed at a rate of upwards of twelve knots, though against a head wind. About six o'clock the weather cleared up, and along the Fuegian side there was a beautiful pale bluish-gray sky, sprinkled with delicate silvery clouds. By and by part of the Patagonian coast became exquisitely dappled with pale gold and purple tints, and the sun set gloriously right ahead of us, on this the longest day of the year. In the course of the evening a number of minute Diptera flew on board, while earlier in the day a small yellow ichneumon fly was captured. We passed rapidly through the First Narrows, and anchored, between ten and eleven P.M., in Philip Bay on the Fuegian coast. Shortly after this some of the men tried their luck in fishing, and although no fish were procured, a fine mass of a compound Tunicate, a species of the genus *Aplidium*, was hooked up, and handed over to me. This, which is apparently a new species, to which I have given the specific name of *Fuegiense*, was of a very firm consistence, a good deal resembling one of the fleshy alcyonoid polyp-masses. The ground colour of the mass was a bluish-gray, while the

numerous animals imbedded in the common matrix were a light yellow. Attached to the base were two species of Algæ, a hydroid Polyp, and a portion of an Annelid tube, formed of fragments of shells cemented together. We retired to rest, well pleased to be at anchor again, and looking forward with curiosity to the doings of the following day.

Next morning before breakfast, while the anchor was being got up, a jackass penguin (*Spheniscus Magellanicus*) paid us a visit, and was gazed at with much interest as the first specimen of that singular tribe of birds which we had beheld. The day was fine, though cold, and we pursued our way prosperously along the Strait, our course lying nearer the Patagonian than the Fuegian coast, and noticed many places, the names of which, in the course of time, became "familiar in our mouths as household words." Our attention was arrested by the smoke of some Fuegian fires on the coast opposite us, and looking southward we descried some noble snow-crowned peaks, one of which was believed to be Mount Sarmiento, a mountain in Fuegia, nearly 7000 feet high, and designated in honour of the famous Spanish navigator Pedro Sarmiento. After clearing the Second Narrows, we passed not far from Elizabeth Island (named after "the bright occidental star"), and our sportsmen were much excited by the numbers of geese to be seen upon it. Many other birds were also noticed swimming in the water or flying about, including a few albatrosses, a number of gulls, and great quantities of cormorants with black and white plumage.

As we neared Cape Negro a change in the aspect of the country took place, for from the entrance of the Strait up to that point low-lying undulating plains, covered with yellow grass and entirely destitute of trees, occurred on both sides of the Strait; while from the Cape, south-westward, on the

Patagonian side, the land assumed a much more elevated character, and was densely covered with wood—a few bare intervals, of limited extent only, here and there intervening. The line of demarcation is singularly striking, and, as we afterwards found, a change in the climate is initiated along with the change in the vegetation, the clear bright weather of the north-eastern part of the Strait being gradually succeeded, as the country becomes more and more mountainous and more thickly covered with trees, by an increase in the rain-fall (which in the east is exceedingly small), till, in the western portion of the Strait and on the west coast of Patagonia, rain, as a rule, descends in torrents every day, and the whole country is wringing wet.

Between two and three o'clock we reached Punta Arenas, or Sandy Point, the site of a small settlement established by the Chilian government, and anchored in the roadstead—the intendénte or governor, Don Damian Riobo, coming off soon after to pay his respects, and, in conformity with instructions from his government, to render offers of assistance to Captain Mayne in carrying out the survey. The settlement, the only one in the Strait with the exception of a small outpost at Freshwater Bay, about twenty miles to the south-westward, was, at the time of our arrival, almost entirely a penal one, the population, with the exception of a few artizans, including a Russian and a Yankee blacksmith, etc., consisting of Chilian convicts, transported for a variety of offences, and maintained under military discipline; a detachment of about fifty soldiers, under a captain and lieutenant, being stationed here to preserve order. About a year later, however, the number of the inhabitants was considerably increased by the arrival of about five hundred emigrants from Chiloe, who were subsidised by the Chilian government until able to maintain

themselves in their new quarters. An intention was also cherished, I believe, to endeavour to establish a colony of Germans, at some future period, to assist in clearing the land; but I believe this has not yet been accomplished. There can, I think, be no doubt that the Chilian government have acted wisely in selecting Punta Arenas as the site of a colony, as, from the character of its climate and situation, it combines many advantages not to be met with in an equal degree in the country to the eastward or westward. Although the anchorage is decidedly inferior to that of Port Famine to the south and westward, where a settlement was established, first by Sarmiento, in 1583, and afterwards by the Republic of Chili, in the present century, the climate is greatly superior, being much less humid. On the other hand, the situation excels any spot to be met with in the country to the north-eastwards, in possessing a sufficient rainfall, a small river, extensive forests where an abundant supply of timber may be procured, and considerable tracts of open ground suitable for cattle-grazing. There is, however, considerable room for doubting as to whether the colony can ever be self-supporting. The climate, which, though very pleasant in summer—when there is beautiful weather, resembling that often met with in the end of September and beginning of October in Scotland—does not appear to be warm enough for the ripening of cereals, with the exception of the hardier kinds, such as rye and some forms of barley, although green crops, such as potatoes, pease, cabbages, and lettuce, often come to maturity. A deposit of coal, apparently of tertiary age, and probably of the same date with that occurring at Lota in South Chili, was discovered some years ago, but as yet it has not been worked to any great extent, and, I confess, it appeared to me of very inferior quality. Gold has also been found in the bed of the

river; but it remains to be proved whether it occurs in sufficient quantity to pay extensive working. Timber there is in plenty; but, as gigantic forests exist in South Chili, the mother country can be but little benefited by it. Time, however, will alone show whether this opinion is correct; and I need hardly say I should be very glad to find it disproved by the steadily-increasing prosperity of the colony, which, besides owing many improvements to the able management of the present governor, Señor Viel, has, within the last year or two, been brought into more immediate contact with the civilised world by the passage of the Pacific Steam Navigation Company's vessels through the Strait, on their way to and from Valparaiso. A curious instance of the changes that may occur within a very short period of years is furnished by the establishment of this new line of steamers; for at the commencement of our survey there was no regular traffic through the Strait, so that it was quite an event to encounter a vessel, while probably before these words are in type there will be a fortnightly service in each direction.

Sandy Point, the general appearance of which may be gathered from the accompanying sketch of one end of it, as seen in winter, with snow on the ground, consists of a number of wooden dwellings, grouped so as to form one long street, running nearly parallel with the beach, but situated on a low ridge, at about five minutes' walk from it, with a few shorter ones directed at right angles to it, and near one end a considerable square space of grass—the future plaza—at one side of which a large wooden house, intended for a school, was erected not long after our first visit. The three principal buildings are the church, the governor's house, and nearly opposite this the Fort, an edifice much like a child's house of cards, and which, from the associations suggested by it with the

F. Le B. Bedwell, del.t

Waterston & Son, Edin.r

PUNTA ARENAS. (SANDY POINT).

habitation of two time-honoured functionaries, soon received from some of the officers of the "Nassau" the irreverent appellation of "the Punch and Judy House." The sketch gives a very correct idea of the appearance presented by the citadel in question, and the government house.

I need hardly state that the greater number of us were eager to land; and accordingly, immediately after the governor's visit was over, two boats left the ship, one with Captain Mayne and several of the surveyors, who were anxious to avail themselves of the opportunity afforded by the clear bright afternoon to obtain a set of sights; and the other well filled with a party equipped with guns and collecting apparatus.

The landing-place, close to which are a couple of boat-houses, is not so good as might be, the boats requiring to be run up on a shelving beach, on which, after certain gales, a furious surf beats. A wooden pier, on piles, was in course of construction at the time of our arrival, and when it was finished was found to be of considerable benefit; but, unfortunately, it was carried away nearly bodily by a violent easterly gale at the close of our first season, and when we bid a final farewell to the settlement in April 1869, it had not been replaced.

On landing, my attention was at once arrested by a considerable number of plants in bloom on the flat ground between the beach and the settlement. Among the most plentiful were a beautiful species of Sisyrinchium (*Symphyostemon narcissoides*, with a flower-stem about nine inches high, crowned with drooping white bells streaked with purple, and possessed of a delicious fragrance; an acaulescent composite plant, with pale purplish-white very fragrant flowers; and a variety of the common dandelion (*Taraxicum*

officinale var. lævigatum), a plant which enjoys a wide range, being distributed over Europe, Northern and Central Asia, and North America. Here also a pretty little narrow-leaved barberry, now almost out of flower, covered the ground in many spots with its prostrate stems ; while, a little further from the beach, the handsome yellow-flowered *Geum Magellanicum* formed a conspicuous object. On the banks of the ridge on which the houses stand, a *Calceolaria* (*C. plantaginea*) with four or five somewhat hairy ovato-rhomboid radical leaves, and a flower-stem varying from six inches to a foot high, surmounted by three or four elegant yellow flowers ; a *Viola*, with similarly coloured flowers ; a shrubby composite plant, the *Chilabothrium amelloides*, growing from two to three feet high, and bearing rather large yellow-disked and white-rayed flowers ; and a small fern (*Lomaria alpina*), common in temperate South America, and also met with in New Zealand, Van Diemen's Land, and the mountains of South Australia, were abundant. A neighbouring watercourse yielded me specimens of a stout-growing Composite, with large heads of white flowers, nearly equalling in size those of the ox-eye daisy, as well as several grasses, one of which, the *Phlœum alpinum*, is not uncommon on the Highland mountains of Scotland. One still more familiar plant was the shepherd's purse (*Capsella Bursa-pastoris*) ; but this evidently must have been introduced through the agency of man, as I never saw it except in the vicinity of the settlement.

Before setting out on our walk, several of us went to see some tame guanacos (quadrupeds to which I shall make frequent reference in this narrative), kept in an enclosure near the governor's house. While we were engaged in inspecting them, they favoured us with a fine illustration of their

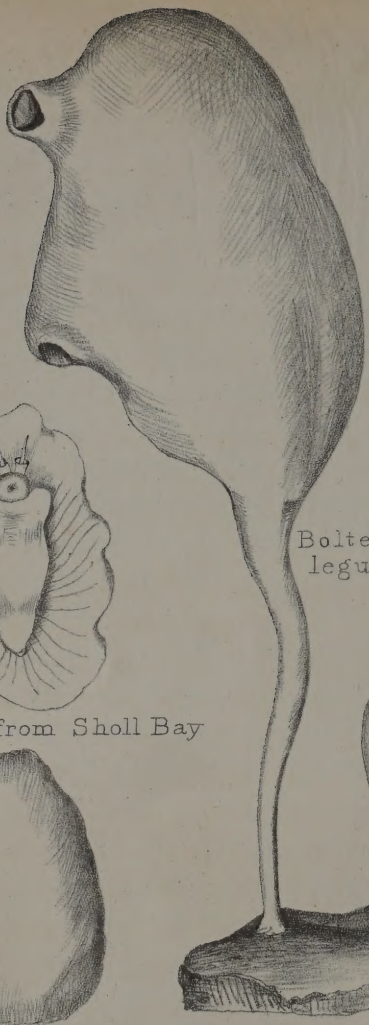
spitting capacities, as exercised upon a party of Yankee sailors who had run from a ship passing through the Strait some months previously, and were now exercising their ingenuity in teasing the poor animals. Gradually the guanacos approached nearer and nearer the paling which separated them from their assailants, at the same time going through a process of churning up the saliva in their mouths, till, all preparations being completed, a volley was projected to a distance of two or three feet, after the fashion of a hot-house squirt, right in the faces of the enemy, who precipitately retreated.

This instructive exhibition over, I proceeded to walk down to the beach in search of spoils in the shape of marine animals. On the flat ground over which I passed many specimens of a little bird, which reminded me of a *Saxicola*, were hopping about and lighting on the low bushes. This was the *Centrites niger*, widely distributed over South America, being found, according to Mr. Darwin, "in La Plata, Patagonia, Tierra del Fuego, and on the west coast, at least as far north as the valley of Copiapo, in Northern Chili." The plumage of the male bird is russet and black, and that of the female grayish; and though a bold little bird, our sportsmen at first found them so difficult to shoot, that the cognomen of "ironclads" was bestowed upon them. I was much perplexed as to the true nature of a large long-necked bird which was stalking about on the open ground at a distance, but, later in the day, saw several specimens on the wing, and ascertained that they were a large species of ibis, the *Theristicus melanopis*, known to the Chilians under the name of "Bandurria."

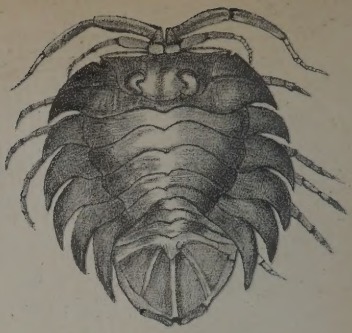
On reaching the shore I found a few additional plants growing in the sand, a little above high-water mark. Of these one

was a *Plantago*, much like *P. maritima;* and another, a Senecio (*S. candidans*), with a tall stem and large undivided leaves, clothed with a white woolly substance, and yellow rayless flowers. This latter plant I often met with subsequently, in various localities in the eastern part of the Strait, in general forming a well-marked zone above high-water mark, and also at the edge of small salt lakes near the sea, the peculiar colour of its foliage causing it to be easily recognised at a considerable distance. One or two of the other species of *Senecio*, occurring in the Strait, also possess this woolly character; but none of them are plants of the same stature, nor do they grow quite so close to the sea.

It was now nearly low tide, and a large spit, from which the name Punta Arenas is derived, was consequently uncovered, and at its outer extremity a flock of terns (*Sterna cassini*), with black-crowned heads and pale ash-coloured and white bodies, were busily engaged in feeding, where a bed of small mussels (*Mytilus Chilensis*) extended. The birds allowed me to approach them rather near, and then rose in a body into the air, flying about in a cloud over my head, and uttering a torrent of sharp angry cries, indignant at the stranger who had ventured to disturb them at their meal. I carefully searched the rounded stones on the spit for marine animals, but was not very successful in my quest. Higher up on the beach, however, I met with many stranded masses of *Macrocystis*, and from their branching roots extracted a number of live specimens of a curious Isopodous crustacean (*Sphæroma lanceolatum*), which coils itself up in a ball when alarmed, as well as some molluscous horny egg-cases of a pale yellow colour, which subsequent research proved to be those of the *Fusus Geversianus*, a characteristic Magellan mollusc.

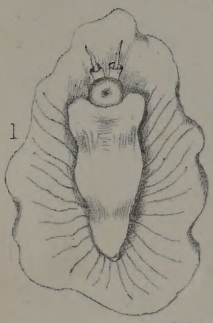


Boltenia legumen.



Serolis Orhigniana

Cassidina emarginata



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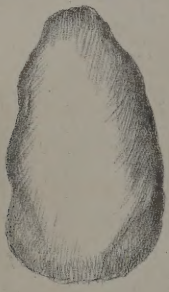
1. Peronia from Sholl Bay



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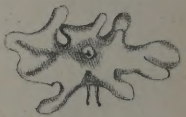
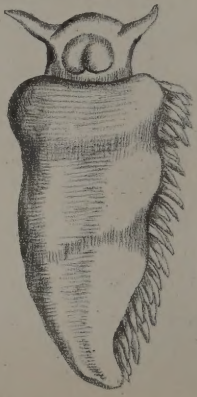


* Sucking-disc of another specimen

2



2. Eolis from Swallow Bay

* Sphyrion.

Where the beach was free from stones and formed of fine sand, I picked up many specimens of a species of a very remarkable genus of Isopoda, of which about half-a-dozen species have been described from South America, and all, save one which is found on the Chilian coast, from Patagonia, Fuegia, and the Falkland Islands. This was the *Serolis Orbigniana*, of which I give a sketch. It is closely allied to the *S. Fabricii*, the type of the genus, but differs from that species in having the extremity of the last segment of the pleon deeply excavated instead of presenting a rounded tip. In common with the other members of the genus, it certainly presents a wonderful resemblance, at first sight, to the extinct Trilobites, of which it was at one time supposed to be an ally, though differing widely from them in certain important points, such as the possession of well-developed limbs and long antennæ.

Pursuing our way along the shore I picked up many fragments of a large crab, of which I afterwards obtained excellent specimens. This was a species of *Lithodes*, the *L. antarctica*, much like our northern European species, *L. arctica*, but sufficiently distinct from it, and attaining a considerably greater size. It is one of the commonest of the Crustacea of the Strait of Magellan, and on the west coast of South America extends as far north as the island of Chiloe, where I saw it. Like the other species of the genus, the pleon or tail-flap of the female is orbicular in form, and remarkable for its enormous development and the absence of bilateral symmetry exhibited in its shelly plates; those of the left side, which alone bear the pleopoda or ovigerous appendages being double (or even more) the size of those on the right. The animal is of a bright brick-red or scarlet colour, and the carapace and limbs are armed with strong spines, which,

however, are more than twice as numerous in young as in old individuals. The species appears to inhabit rocky ground in rather shallow water, and its movements are very sluggish.* The last joints of the limbs (especially the anterior ones) are provided with numerous fasciculi of short yellowish-brown hairs, and the inner surface of the pincers is partially invested with a blackish horny substance.

Many gulls were feeding on the beach, and here and there a dull brown-coloured hawk was to be seen diligently investigating some of the débris left by the waves. It was a bold bird, not taking alarm till approached very closely, when, uttering a querulous scream, it would fly off and perch again at a short distance. This was the Chimango (*Milvago Chimango*), very common in the eastern part of the Strait, and throughout Chili. I may here remark that I never observed it feed on living prey, and almost invariably noticed it on the beach or its immediate vicinity.

A few birds were shot on this occasion by the other members of the party, including a specimen of a thrush (*Turdus Falklandicus*), on the throat of which I found the examples of a large tick (probably a species of *Dermanyssus*), attached, and two long-tailed green parroquets (*Conurus cyanolysius*). The occurrence of a member of the parrot family so far south strikes the traveller at first sight as very remarkable, and it is not surprising that it should have attracted the attention of several of the earlier navigators who braved the dangers of the Strait. Thus, in the voyage of Oliver van Noort in 1599, and in that of Spilbergen undertaken fifteen years later,

* As a curious fact in the history of our northern *Lithodes arctica*, I may mention that some years ago, in removing the carapace of a female, I found five live specimens of a bivalve mollusc, a species of *Saxicava*, lying in the branchial chamber under the gills.

reference is made to fair woods in the Strait of Magellan full of parrots ; and Captain Wood, in his interesting narrative of this "Voyage through the Streights of Magellan in 1699-70," mentions that in a wood at Port Famine he "saw five birds, among which was a small parrot or parakite." The species appears to be tolerably common throughout the wooded country on the shores of the Strait, and the channels on the west coast of Patagonia, and is also abundant at Chiloe. It generally flies in small flocks, which herald their approach by a series of short screams, lighting on the topmost branches of the trees, where they scramble about with their bodies lying close to the boughs, a habit which, together with their green colour, which closely approximates to that of the foliage, renders them difficult to perceive, and thus screens them from danger. According to Captain King (and an examination of the contents of the stomachs of various individuals has enabled me to verify this observation), they feed chiefly on the seeds of the Winter's-bark tree, to be afterwards mentioned.

Our delightful ramble this day was brought to a close about 8 P.M., when we returned to the ship, and the only circumstance worthy of record that occurred during the evening was the capture on a fishing-line of a cuttle-fish of the genus *Octopus*, which was exceedingly agile, and exhibited most decided objections to being made a martyr to science. This, almost the only species of Cephalopod which I met with in the Strait, is, I believe, the *O. megalocyathus*, characterised by the large size of the sucking cups on the arms, and seems to be far from rare, as I dredged specimens in many localities ; and on two or three occasions numerous large individuals were found lying on the beach at Sandy Point after the prevalence of severe gales.

The 23d was a pleasant bright day. A surveying party,

who went on shore in the morning to take sights, brought off with them, on their return to the ship, a nest with eggs, which they found in a hollow in a sandy bank. In the afternoon a small party of us landed, and had an agreeable walk through the forest at the back of the settlement. Its general aspect reminded us in many respects of our own familiar English woods, with the exception that there was a greater preponderance of prostrate trunks and erect whitened skeletons. The prevailing tree was the antarctic beech (*Fagus antarctica*), but an evergreen species of the same genus (*F. betuloides*), which occurs much more plentifully farther west in the Strait, and the Winter's-bark tree, were also present. The accompanying sketch may assist in giving the reader some idea of the foliage of the three trees, which I shall here briefly notice. The first, or antarctic beech, which forms the mass of the woods from where the wooded country begins for some distance to the westward of Port Famine, is a very beautiful tree, frequently attaining very large dimensions, both as regards height and girth. Its method of branching is considerably different from that of our native beech, and its bark likewise differs in having a rough instead of a smooth surface. Young trees growing by themselves on the outskirts of the woods present frequently a most graceful appearance when lit up by the sun's rays, and often reminded me in their habit of growth of a cedar. The leaves are rather small, being seldom more than an inch in length, of an oblong-ovate form, with rounded teeth at the margin, and their surface is rougher than that of the British beech. The tint of the foliage, though not of that delicate tender green shade which is the glory of our beeches in spring, is very beautiful, and the autumnal tints on the fading leaves are fine, varying from golden yellow to a rich reddish brown. The beech-nuts are very

Foliage of
Antarctic Beech

Foliage of
Evergreen Beech

small—not a sixth of the size of those with which we are familiar. I was interested by observing that, in the western part of the Strait, where the following species prevails at the level of the sea and for a considerable distance up the mountain sides, almost to the exclusion of the deciduous beech, a well-marked zone of the latter is often to be met with above the evergreen woods, and small stunted bushes also frequently occur on the summits of the mountains, at a height of 1500 to 2000 feet. In autumn, this deciduous zone becomes peculiarly well marked, in consequence of its light reddish-brown colour, which contrasts remarkably with the dark green hues of the woods below.

The evergreen beech (*Fagus betuloides*) which, from its peculiar characters, was not recognised to be a species of this genus by the earlier voyagers, some of whom seem to have regarded it as a species of myrtle, is, upon the whole, the commonest tree from the westward of Port Famine, throughout the Strait, and along the west coast of Patagonia, as far as the Chonos Archipelago, where the character of the vegetation is rather more diversified. It sometimes attains a considerable size where the individual tree has space to develop itself, but I do not think ever equals the antarctic species in either height or bulk, and, as a rule, the trees of it grow so close together, that they seldom exceed 15 or 20 feet in height. The bark is smooth and of a gray colour, a good deal resembling that of the common beech, and the leaves are oval, crenulated, or serrated at the edges, and of a dark shining green colour. They vary much in size in different situations : those most exposed to the winds being, in general, much smaller than those that grow in more sheltered localities. They never exhibit those folds which the young leaves of the antarctic species do, in common with these of our native beech. The wood of both the antarctic and the evergreen species is, I believe, of rather good

quality; but the value of the larger trunks is considerably depreciated by the tendency to decay to which the heart-wood is liable.

The third tree, or Winter's-bark (*Drimys Winteri*) is very different in almost all its characters from the other two. It belongs to the same order as the magnolia, and forms a noble tree, with smooth gray bark, leaves from three to four inches long, shaped somewhat like those of a laurel, green on the upper and silver-gray on the under surface, and masses of rather large white flowers at the end of the branches. It extends throughout the wooded country of the Strait and western Patagonia, and is abundant in the wooded parts of Chili, where, however, it becomes somewhat modified in form, and has been regarded as a distinct species, under the name of *D. Chilensis*. It was noticed by nearly all the older voyagers through the Strait, and derives its popular name of Winter's-bark from Captain Winter, who accompanied Sir Francis Drake in his circumnavigation of the globe, during the years 1577-80, and employed its bark as a medicine, and also in the way of condiment for his crew, finding it a useful anti-scorbutic. It is thus noticed by Sir Richard Hawkins, who visited the Strait later in the same century :—"Some of our idle time we spent in gathering the barke and fruit of a certaine Tree which we found in all places of the Straits, where we found Trees. This Tree carrieth his fruit in clusters like a Haw-thorne, but that it is greene, each being of the bignesse of a Pepper-corne, and euery of them contayning within four or five granes, twice as bigge as a Musterd-seed, which broken are white within, as the good Pepper, and bite much like it, but hotter. The barke of this Tree hath savour of all kinde of Spices together, most comfortable to the Stomack, and held to be better than any Spice what-soeuer. And for that, a learned Countriman of

ours, Doctor *Turner*, hath written of it by the name of *Winter's Barke*, what I have said may suffice. The leaf of this Tree is of a whitish greene, and is not vnlike to the Aspen leafe." A very good description, if we except the remark on the form of the leaf, which inclines one to believe that the worthy knight's conceptions of an aspen leaf must have been somewhat vague.

Two of the party gained a momentary glimpse of a fox in the gorge through which the river, already referred to, flows ; and we saw a pair of large woodpeckers—the plumage of the female of which was black, while the male was provided with a scarlet crest—run spirally up the stem of a tree, tapping the bark as they went. This species, the *Campephilus Magellanicus*, first, I believe, described by Captain King, was only met with at Sandy Point, and that but during our first season; for as the colony extended, and a considerable amount of timber was in consequence felled, several species of birds became very scarce, probably retiring into the fastnesses of the forest. Two circumstances specially arrested my attention in the subsequent examination of several specimens of this woodpecker—viz. the enormous quantities of parasitic Anoplura occurring on the feathers, greatly exceeding in number those found on any other birds, with the exception of some of the carrion-feeding hawks ; and the extreme tenacity with which the skin adhered to the muscles of the body, neck, and head,—requiring to be carefully dissected off, and adhering to the crown of the skull almost as intimately as periosteum.

A few species of Coleoptera were picked up, including a pretty *Carabus* (*C. suturalis*) and one of the Rhyncophora, with a blunt projecting spine on each elytron; but insect-life, in general, appeared to be at a discount, and a more intimate

acquaintance with the entomology of the Strait did not cause me to alter my opinion in this respect.

In the evening several of the men were amusing themselves in fishing from the ship, and some specimens of a curious worm-like fish, the *Myxine Australis*, discovered by Mr. Darwin, were taken. A dead valve of a bivalve mollusc was also obtained, with a curious flattened disc-like horny case, about an inch and a half in diameter, attached to the inner surface, which, on being opened, was found to contain three shells of a young Gasteropod, apparently a species of *Fusus*. The shells were about one-fourth of an inch long, of a delicate pink colour, with a thickened and distorted spire.

On the following day I landed with three of the officers who were bent on parrot-shooting, and remained in the woods with them till late in the afternoon botanising and zoologising. On the outskirts of the trees I found several plants that I had not observed in my former walks, and among these were a buttercup growing about a foot high (*Ranunculus pedunculares*) and a white-flowered *Anemone* (*A. decapetala*), which, according to Dr. Hooker, possesses "a very extended range throughout the American continent,"—in North America abounding "from the Arctic Circle to the Columbia river on the west coast, and New York on the east; while, in South America, it reappears in Peru and Chili on the west side, and in South Brazil in the east, extending from each as far south as the Strait of Magellan." It was a bright sunny day, and numerous butterflies belonging to two species—one apparently a *Pieris*, and the other a small copper-coloured *Lycæna*—were fluttering about the flowers. These, with two other species subsequently taken, constitute the only diurnal Lepidoptera observed by me in these regions.

On penetrating into the woods, my interest was speedily excited by a variety of plants, among which the following were the most striking:—On the branches of many of the beech-trees were numerous rounded nest-like masses, about the size of the human head, and of a yellowish colour. These proved to be formed of a curious leafless parasitic plant, allied to mistletoe, a species of the genus *Myzodendron*, the *M. punctulatum*. The Myzodendra are, I believe, limited to southern South America, occurring in the forests from Cape Horn as far as Valdiviva. Four or five species have been described from Fuegia, and their structure and method of growth have been fully elucidated by Dr. Hooker in the *Flora Antarctica*, to which I must refer the reader for full details concerning them. The most striking peculiarity of the genus consists in the possession by the fruit of a plumose pappus, composed of three downy-looking setæ, formed of very delicate elongated viscid cells, filled with a glutinous matter like that of the fruit of the mistletoe, and which serve to attach the fruit to the tree, till the seed germinates and takes root in the bark. On a subsequent occasion I met with a second species (*M. brachystachyum*) also occurring on the beeches, but differing from the *M. punctulatum* in the possession of leaves, and the much greater thickness of the twigs.

Another parasitic plant, of a very different order, of which I obtained many specimens in all stages of growth, was the remarkable *Cyttaria Darwinii*, an ascomycetous fungus, which, like the *Myzodendra*, occurs on the stems and branches of the deciduous and evergreen beeches. It is of a nearly spherical form, varying in size, according to its age, from the dimensions of a pea to those of a moderate-sized apple. When young it is of a pale yellowish-white colour, and has a uniform smooth surface; but, as it advances in age,

it assumes a bright yellow tint, verging on orange, and the surface becomes perforated with numerous pits, which are lined with the hymenium. It constitutes one of the articles of food of the Fuegian Indians; but, as Mr. Darwin has remarked, it has little to recommend it, being very tasteless and of a tough consistence.

Growing in plenty under the shade of the trees were two species of orchids—one, an *Asarca* (*A. Kingii*), with a peduncle sometimes as much as eighteen inches high, and a spike of yellow flowers; and the other, the beautiful *Codonorchis Lessonii*. The latter elegant species bears a slender stem, about a foot high, with two or three verticillate leaves, and a terminal, solitary, rather large, triangular-shaped white flower, delicately marked with purple, particularly on the labellum, the upper surface of which is covered with peculiar raised glands. The plant appears to possess but a limited range in the Strait of Magellan, as I never met with it to the westward of Port Famine; and it is, therefore, limited (in so far as my observations extend) in the Strait to woods characterised by a prevalence of the Antarctic beech. Two years later I found many specimens of it in woods in the north of Chiloe, and probably it does not extend northwards far beyond this point. Another pretty plant obtained on this occasion was the *Cardamine geraniifolia*, the flowers of which are of a delicate white tint, and the leaves of a tender green and very elegantly divided; and two species of barberry were also met with—one, the handsome *Berberis ilicifolia*, now out of bloom; and the other, the *B. dulcis*, which still presented a few lingering flowers. The former of these is always met with either in woods or their outskirts, sometimes forming dense thickets, and the plants attain a very large size, being sometimes as much as upwards of ten

feet in height, with the main stem three inches in diameter. The branches are in general much overgrown with mosses and lichens ; the leaves resemble those of the holly ; and the flowers, sometimes nearly as large as cherry-blossoms, are of a splendid orange-yellow hue, verging on flame-colour, and are arranged in corymbs. The month of November seems to be the principal flowering time ; but a second flowering, much more sparse in its character, frequently takes place in the autumnal months of April and May. The berries are of the bluish-purple colour so common in species of the genus, and of an elongated form. They contain large seeds, and are insipid to the taste. The latter species (*B. dulcis s. buxifolia*), though often met in the outskirts of woods, is equally characteristic of open situations, occurring very plentifully on the plains of Eastern Patagonia, where it is frequently the only shrub to be seen. It forms thick bushes, from three to eight feet high, which often exist in clumps together, affording a good shelter in camping out, and furnishing a comfortable lair for the puma and other wild animals. The leaves are much smaller than those of *B. ilicifolia*, and are generally about the size of, or a little larger than, those of a Box, hence one of the specific names. The young leaves are frequently attacked by a parasitic fungus of a bright orange colour, the *Æcidium Magellanicum ;* and those in this condition are generally of much larger size than the healthy ones, as well as distorted in form. The flowers are much smaller than those of the holly-leaved species, of a paler yellow tint, and arranged in a more scattered manner. The berries, which are bluish-purple, with a bloom on the surface, and about the size of black currants, possess a flattened spherical form, and a very agreeable sweet taste, with a dash of acid in it. They are justly mentioned with approval by

several of the older voyagers,—Spilbergen speaking of "store of shrubs with sweet blackberries;" and Wood remarking of the country in the eastern part of the Strait between Elizabeth's Island and the Second Narrows, that "it produces also small Berries, which are excellent good Fruit, and to which we gave the Name of *Magellan* Grapes. They are of a purple Colour, seeded, and taste like our *European* Grapes: they grow singly on small Bushes, like Berries." And again, in his description of Port Famine, observing that, betwixt the wood and the water-side, "there grew Abundance of *Magellan* Grapes, Hearts, and other small Berries, which are all good Fruit, and grow all the Streights over." The species occurs throughout the Strait and along the west coast of South America. I met with it in abundance as far north as Chiloe, the *B. ilicifolia* being, so far as my observations go, confined to the wooded portion of the Strait and western channels, and not extending north of the Gulf of Peñas. The wood of both species is of a bright yellow colour, and the branches of *B. dulcis* burn with a vivid flame. I may conclude what I have to say on the barberries of the Strait by remarking, that the only other species of the genus which occurs in this region is the little *B. empetrifolia*, which grows on sandy ground between the woods and the sea-beach, never occurring under the shade of trees. Like the other two species, it blooms early in the season. The flowers are of a pale yellow colour, and deliciously fragrant; and the fruits, though small, are sweet and pleasant to the taste.

Many parroquets were shot by the sportsmen on this occasion, as well as a specimen of a pretty little hawk (*Tinnunculus sparverius*) with bluish ash-coloured and rufous plumage, which we afterwards found to be common in the Strait. It is abundant in Chili, where I was told it

bears the name of "anicla," and is, I believe, widely distributed over the American continent. It is a bold little bird, as the following incident, which occurred the same day, will show. While walking in an open space near the entrance of the woods, I suddenly heard a rustle of wings, and, on turning round to ascertain the cause, an individual of this species flew right at me, coming within a foot of my head. It then perched on the dead branch of a tree, about a couple of yards off, and scolded at me. As I was without firearms wherewith to secure the prize, I threw some pieces of stick at it, when it made a second swoop at me, again alighting on a neighbouring tree and scolding fiercely. This manœuvre was repeated several times until I was fairly clear of the wood.

The 25th, Christmas Day, was celebrated by a large party of the officers (for the most part armed with guns) landing in the morning and spending the day on shore; the greater number of us wending our way along the shore, and the open flat country, dotted with shrubs of barberry and *Chilabothrium*, which stretches for some miles to the north-east of the settlement, between the woods and the shore, and which afterwards received the appellation of the "Bandurria plains," in consequence of being much frequented by the bird of that name. On the beach I found many dead specimens of two bivalve molluscs, the *Chione exalbida* and *Darina Solenoides*, as well as fragments of the shells of the *Fusus Geversianus* and *Voluta Magellanica;* and on the plains I obtained several species of plants which I had not previously seen. Among those which specially attracted my attention, I may mention a small papilionaceous yellow-flowered plant, presenting a considerable resemblance to our own *Lotus corniculatus*, so commonly met with on sandy downs—(the *Adesmia lotoides*,

one of the three Magellanic representatives of a genus chiefly characteristic of Chili and Patagonia); an orchid with large greenish flowers, marked with black veins (the *Chloraea Magellanica*); a Composite plant with yellowish orange rayless flowers, possessed of a sweet honey-like odour; a plant of the same order, with stiff, narrow leaves, armed with minute spines, and pretty fragrant blue flowers (the *Homoianthus echinulatus*), and a large fungus of the genus *Lycoperdon*, forming masses about the size of a child's head, and with the outer coat, in general, cracked into polygonal fragments.

Swallows were sweeping rapidly over the plains, and several small flocks of ibises were seen, but no specimens shot, owing to their extreme wariness when on the ground, and the height at which they flew in the air when they suspected danger. A single specimen of a snipe was, however, procured, as well as an example of that marvellous bird, the Logger-head or steamer-duck, which was suddenly disturbed while it was reposing on the beach, and with great rapidity took to the water, where it was shot, before it had paddled out any great distance, by two of the officers, one of whom afterwards evinced a most commendable zeal for the advancement of science by undressing and swimming out for it. This, our first sight of a bird of which we had heard or read so much, caused great excitement at the time, as we were not then aware that it was one of the most common birds in the Strait. Deferring my observations upon the steamer-duck for a few pages farther, I may here remark that the snipe, which, along with the other specimens of birds collected during the voyage, was submitted to Messrs. Sclater and Salvin for determination, proved to be the *Gallinago Paraguiæ*, which, I believe, is also common in the countries bordering on the river Plate. Later in the season (in the month of April), we met

with it in considerable numbers on a comparatively limited tract of country covered with low bushes of *Chilabothrium*. As a rule, it lay very close to the ground, and would not take wing till the sportsman was within two or three yards of it, when it flew off, lighting again at about thirty or forty yards distant. A few specimens were seen on the open ground, nearer the eastern entrance of the Strait, and one or two were also shot in the damp wooded region of the west; but we nowhere met with the bird in plenty save in the neighbourhood of Sandy Point.

A fine female specimen of the large woodpecker, already mentioned, was this day shot by Captain Mayne, and one or two small birds obtained, but nothing else deserving of special record in this place. We returned on board to a late dinner, when the wardroom was decorated with *Myzodendron* and holly-leaved barberry, in lieu of mistletoe and holly, and a large party sat down to the feast, which, in addition to orthodox viands in the shape of roast goose and sucking-pig, was distinguished by the introduction of a parrot-pie, which was voted excellent by all who partook of it.

Next day I was busily occupied throughout the morning, in skinning birds. In the afternoon I landed with two of the officers, and walked with them over the plains, to visit a strip of brackish water, about five miles distant, which, in consequence of its communicating with the sea at high-tide, was dignified by the name of "*the* Lagoon." At the place of its occurrence the open ground ceases, the woods coming down to the edge of the beach; and my companions had been informed that waterfowl were often to be met with in this sheltered situation. It was a most beautiful day, and we reached our destination after a very agreeable walk, almost everything observed on our way possessing the charm of novelty. In the

strip of water with which the tide had begun to mingle I noticed many live specimens of the *Serolis Orbigniana*, some slowly crawling along the bottom, while others rapidly paddled along the surface on their backs. Leaving my associates to walk farther along the beach in pursuit of some ducks at a short distance, I entered the woods, and was greatly delighted by their beauty, for the leaves of the beeches still retained their fresh greenness, and an endless variety of light and shade was produced by the slanting beams of the descending sun stealing in here and there. Perfect silence reigned around, save for the trickling of a small stream which wound its way through the trees, and the occasional hum of a musquito, or the distant tap of a woodpecker. The ground in many places was carpeted with mosses ; the lovely *Codonorchis* displayed its white flowers in abundance, and many of the fallen trunks were thickly fringed with the delicately-cut fronds of the *Cystopteris fragilis*, which, in common with several other species of our native ferns, possesses a very wide range. In Hooker's *Synopsis Filicum* its habitat is given as " Europe and Asia everywhere from Iceland to Kamtschatka, from the Arctic regions to Madeira and the Himalayas, where it ascends to 15,000 feet ; mountains of Abyssinia and Fernando Po ; South Africa ; Van Diemen's Land, New Zealand, Sandwich Islands ; temperate N. and S. America ; and mountains in the intermediate tropical zone."

After some time spent in exploration I rejoined my companions, and, as it was getting late, we began to retrace our steps homewards. It was a lovely serene evening, and an exquisite soft light was shed over the sward near the sea, and on the scattered beeches close to the woods, many of which reminded us of cedars in the manner of their growth ; and, to add to our pleasure, thrushes made their appearance on some

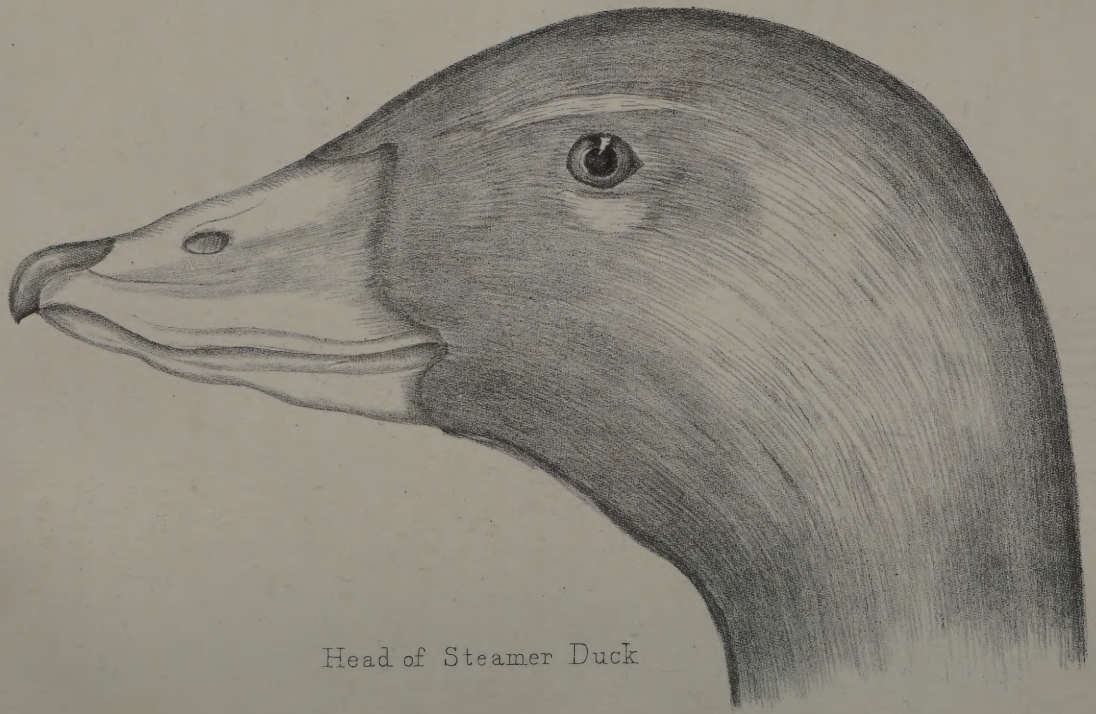
of the topmost boughs of the trees, and poured forth a flood of melody most grateful to the ear.

While we were engaged in looking for a place to cross a stream, with the intricate windings of which it took some experience to become acquainted, a large owl was discovered perched on the branch of a neighbouring tree, and shot. It proved to be a fine specimen of the *Bubo Magellanicus*, a species which, I am informed by Mr. Sclater, ranges over nearly the whole extent of North and South America, being identical with the well-known Virginian Horned Owl. We were struck with the cat-like appearance which its great yellow eyes communicated to its countenance. The plumage of this species, which sometimes exceeds two feet in length, is beautifully mottled with a variety of shades of black, brown, and gray. In the Strait of Magellan, besides occurring in the wooded districts, it is far from rare in the open country, where it sometimes may be seen perched on the barberry bushes, or sailing quietly along on the lookout for its prey, which consists in great measure of rodents of various species. We got on board that evening between nine and ten P.M.

The following day (27th) I was busily occupied all forenoon in skinning the steamer-duck shot on Christmas day; and as I shall frequently refer to the bird in the course of my narrative, I shall offer a few general remarks on its history in this place. The earliest notice of the steamer-duck with which I am acquainted occurs in the voyage of the celebrated Pedro Sarmiento, who visited the Strait in 1582; and in an account of the principal birds of the Strait, describes "patos pardas y bermejas sin pluma que ne vuelan, sinó á vuela pié corren, y par el agua no se pueden levantar sino a vuela pié, dando con las alones á manero de remo. Huyen por el

agua con mucha velocidad, y desan un rastro por el agua como un bajel quando vaga." For the next mention of the bird we are indebted to the narrative of the circumnavigation of the world by Oliver van Noort, undertaken sixteen years later. It is there stated, that while in the Strait of Magellan in January 1600, they were driven by a storm into Goose Bay, "so-called of the store of that Fowle, their found fit for swiming and long diuing, but vnable to flie."* There does not appear to be any mention of the bird either in the voyages of Cavendish or of Drake, nor in those of any of the English navigators until after the middle of the seventeenth century; but in Wood's voyage through the Strait in 1669 reference is made to "great Blue Ducks, which last are not very shy"—a very brief description, but which applies more to the steamer-duck than to any other bird which he could have encountered. In the following century, the steamer-duck is noticed by several voyagers, and among these, by one of the most scientific navigators the world has ever seen—the celebrated Captain Cook. In his "Voyage towards the South Pole and round the World, performed by His Majesty's Ships the 'Resolution' and 'Adventure,' in the years 1772, 1773, 1774, and 1775," he remarks, in his account of Christmas Sound, Tierra del Fuego, that "here is a kind of duck, called by our people race-horses, on account of the great swiftness with which they run on the water; for they cannot fly, the wings being too short to support the body in the air. This bird is at the Falkland Islands, as appears by Perety's Journal;" and again, in his description of Staten Land:—"Here were ducks, but not many, and some of that sort we called race-horses. We shot some, and found them to weigh

* It is plain that steamer-ducks and not penguins are intended, as the atter birds are mentioned elsewhere in the narrative.



Head of Steamer Duck

twenty-nine or thirty pounds; those who ate of them said they were very good." The first detailed account, however, of the habits of the steamer-duck is given by that intelligent and accurate observer of nature, Captain Philip Parker King, in his narrative of the voyage of the "Adventure" and "Beagle." He states that, at Eagle Bay, beyond Cape San Isidro, in the Strait of Magellan,* he "saw, for the first time, that most remarkable bird the steamer-duck," and observes that, "before steamboats were in general use, this bird was denominated, from its swiftness in skimming over the surface of the water, the 'race-horse,' a name which occurs frequently in Cook's, Byron's, and other voyages. It is a gigantic duck, the largest I have met. It has the lobated hind toe placed far backwards, and other characteristics of the oceanic ducks. The principal peculiarity of this bird is the shortness and remarkably small size of the wings, which, not having sufficient power to raise the body, serve only to propel it along rather than through the water, and are used like the paddles of a steam-vessel. Aided by these and its strong broad-webbed feet, it moves with astonishing velocity. It would not be an exaggeration to state its speed at from twelve to fifteen miles an hour. The peculiar form of the wing, and the short rigid feathers which cover it, together with the power this bird possesses of remaining a considerable time under water, constitute a striking link between the genera *Anas* and *Aptenodytes*. It has been noticed by many former navigators. The largest we found measured forty inches from the extremity of the bill to that of the tail, and weighed thirteen pounds; but Captain Cook mentions, in his voyage, that the weight of one was twenty-nine pounds. It is very difficult to kill them, on account of their wariness and the thick

* This was about the beginning of 1827.

coat of feathers, which is impenetrable by anything smaller than swan shot. The flavour of their flesh is so strong and fishy, that at first we killed them solely for specimens. Five or six months, however, on salt provisions taught many to think such food palatable, and the seamen never lost an opportunity of eating them. I have preferred these ducks to salt beef, as a preventive against scurvy, rather than from liking their taste." King also distinguished two species of steamer-duck, whereof one (the *Anas brachyptera* of Latham, *Micropterus brachypterus* of Quoy and Gaimard), was entirely incapable of flight; and the other, which he denominated by the specific name of *Patachonicus*, was stated to be smaller in size than the *Brachypterus*, possessed of volant powers, and differing also in other points relating to the plumage. Mr. Darwin, who describes the bird as he saw it at the Falklands, mentions but one species, the original *Anas brachyptera*, which he describes as incapable of flight.

I will now pass on to offer a few remarks on the bird, as derived from numerous observations which I had opportunities of making with regard to it at the Falkland Islands, in the Strait of Magellan, and on the west coast of Patagonia. At the outset I may state that, though undoubtedly some steamer-ducks fly, and others appear to be either wholly incapable of flight, or do not make use of their faculties in this respect, it is, nevertheless, my belief there is only one species of the genus *Micropterus*, and that the variations in size, capability of flight, and colouring of plumage, are chiefly dependent on the age of the birds. Secondly, it is my opinion that it is the young birds that can fly, and that the power of flight or the disposition to fly diminishes with age. I have arrived at this conclusion after the examination of a number of specimens of volant and non-volant birds, having ascertained from

a careful inspection of the condition of the skeleton, and other points in the structure of the volant specimens (the plumage of which entirely corresponded with King's short description of *Micropterus Patachonicus*), that they were all immature individuals (probably the young of the year), and having as invariably found that the non-volant specimens were full-grown birds.

The colouring of the plumage of the adult bird may be shortly described as follows:—The bill is orange-yellow, with the unguis black. The head is cinereous, becoming gradually paler as the individual increases in age, with a small patch beneath the eye, and a streak above it, nearly white. The whole of the upper surface, the throat, the superior part of the breast, and the wings, with the exception of a white speculum, are lead-gray. The lower part of the breast and abdomen vary from a tint verging on primrose-yellow to pale yellowish-white; and the legs and feet are dark yellow.

Younger individuals (*M. Patachonicus*) are chiefly distinguished by their smaller size, their greenish-black bills, and prevalence of a reddish-brown hue on the throat and scapulars.

The average length of the adult birds may be stated as about thirty inches, and I do not think that I ever met with specimens measuring more than three feet from the unguis to the tip of the tail; so that I am inclined to believe that the specimen mentioned by King as forty inches in length was of exceptional size, and I feel no doubt that there must have been some mistake as regards the birds stated by Cook as weighing twenty-nine pounds.

The steamer-duck is very plentiful on the shores of the Falkland Islands, in the Strait of Magellan, and in the channels of Western Patagonia, as well as at Chiloe, which is

the northernmost locality where I have seen it. It is generally to be observed in pairs, or small flocks of six or seven individuals, stationed on the rocks, or swimming about in the extensive beds of the "kelp," which girdles the coast in most spots; but, occasionally, large flocks, composed of many hundreds are to be met with. When undisturbed in the water they swim quietly along, producing two peculiar notes,—that of the male being a sort of mew rapidly repeated, while that of the female is a kind of deep growl—and diligently searching the fronds of the kelp for the animals to be found thereon, or diving for mussels, which appear to be one of their staple articles of diet, as I always found fragments of the shells in the stomachs of those which I examined. The stomach is a most powerful organ, with very thick muscular coats, and the lower part of the windpipe or trachea of the male possesses an enlargement of considerable size. This, which is likewise to be met with in the males of many other species of ducks, serves to modify the voice. At the Falkland Islands, in common with many other birds, the steamer-ducks are much tamer than they are in the Strait of Magellan, allowing the observer to come within a few yards of them without accelerating their speed. When alarmed at the prospect of impending danger, however, they lose no time in getting up steam, paddling through the water at a marvellous rate by dint of flapping their little wings, the motion of which is so excessively rapid, that it is difficult to convince one's self that they are not revolving, leaving a long wake of foam like that produced by a miniature steamer behind them, and not ceasing this method of progression till a safe distance has intervened between them and the object of their dread. They often assist their escape, in addition, by diving, and coming up to the surface at a distance of many yards in a direction

upon which it is impossible to calculate, when they show their great heads for a moment, and then repeat the manœuvre. Though the rate of their speed has, I think, been considerably over-estimated by Captain King, it is yet so great as to render it impossible for a boat, however well manned, to overtake them, except by hemming them in to some small cove, where a gun may be used with a tolerable chance of success. It is in general in such situations that those birds which can fly take to the wing, and those which cannot have recourse to their diving powers. Even when hit they very frequently escape, for unless they receive a very heavy charge of shot, their coat of down and feathers protects them from serious injury. Their nests, in general placed on a sloping bank near the sea, and under the shelter of a low bush, are formed principally of grass. In these four or five large cream-coloured eggs (the dimensions of which may be roughly stated as three and a half by two and a quarter inches) are deposited, and covered with a layer of soft gray down. The young brood appear to be tended by the parent birds for a considerable period after they leave the egg, and may often be seen swimming after them. Like the old birds, they swim and dive actively, coming up after the plunge at a long distance. In the Strait and Channels, where only I had an opportunity of observing them, they were, like their parents, very wary. In a specimen shot in the Channels, the entire upper surface of the body, the sides of the head, and a gorget around the lower part of the neck, were covered with grayish-black down, while the under surface and a spot placed obliquely above and behind the eye were white. The bill, legs, and feet were black, with some light-coloured patches along the edge of the toes. The length, from the extremity of the bill to the tip of the tail, was fourteen inches. Ossification pro-

ceeds slowly in the bones of the cranium, and many of them continue unanchylosed or separable for a considerable period.

Leaving the reader to form his own conclusions from the data which I have supplied as to whether there are one or two species of steamer-duck, I resume my chronicle. On the afternoon of this day, on which I skinned our first *Micropterus*, or loggerhead as it is commonly called at the Falkland Islands, I went on shore with Dr. Campbell, whom the governor had asked to lend his medical aid to one or two of the colonists who were ailing, there being at this time no resident medical man at Punta Arenas, a deficiency which was not supplied till a year later. After these services had been rendered, the intendente showed us his house and garden and stock, which last consisted of the previously-mentioned guanacos, a number of calves and oxen, a large flock of kids, some tame upland geese (*Chloephaga Magellanica*), and two young ostriches (*Rhea Americana*). The last-mentioned birds succeeded in making their escape from their enclosure at the time of our visit, and rushing up and down the kitchen-garden, pursued by the governor's secretary, furnished a most laughable spectacle, as, apparently determined to improve their unwonted opportunities to the uttermost, they ran about, snapping off the heads of the young cabbages and potatoes.

Later in the day, we walked some distance along the beach to the south-westward of the settlement, passing on our way the small Roman Catholic cemetery, with the adjacent space of ground where strangers are buried.

On the sandy beach several large jelly-fish (a species of *Cyanea*), common in the Strait and at the Falkland Islands, with a disc in some cases nearly two feet in diameter, variegated with rich brown and purple, and long arms of the

same colour, were lying stranded ; as also some specimens of a sand-burrowing crab of the family *Corystidæ*, the *Peltarion spinulosum*, which was afterwards met with in various other localities to the eastward, though nowhere so abundantly as about Punta Arenas ; and the examination of the rounded stones left uncovered by the retiring tide yielded us specimens of some additional marine animals, including a few Annelids, a large limpet (*Patella Magellanica*), a small *Siphonaria*, and an odd little flat-backed crab, the *Halicarcinus planatus*, which is very abundant throughout the Strait, and also at the Falkland Islands.

CHAPTER IV.

COMMENCEMENT OF SURVEYING OPERATIONS—EXCURSION TO PATAGONIAN COAST—VISCID PLANTS—DWARF CALCEOLARIA—COLEOPTERA—CHIRODAMUS KINGII—EDOTIA—GUANACO: EARLY NOTICES OF; HABITS, ETC.—CHINCHE OR SKUNK—FOXES—BOLTENIA—BRACHIOPODA OF STRAIT—SECOND EXCURSION—CAPE POSSESSION—CONDORS—VOLUTA FERUSSACII—GALE—SAMOLUS SPATHULATUS—IRON WRECK—INHABITANTS OF NORTH-EASTERN FUEGIA—CATHERINE POINT—CAPE ESPIRITU SANTO—LARGE TUNICATA—SEA-LION—MILITARY STARLING—SARMIENTO BANK—WINDY WEATHER—EXCURSION TO COAST OF ST. JAGO BAY—GEESE—GALE—BURROWING RODENTS—CARRANCHAS—RHEA—BANDURRIA—VISIT THE PATAGONIAN CAMP AT SANDY POINT—PATAGONIANS: ACCOUNTS OF THE OLDER NAVIGATORS; RELIGIOUS AND OTHER CEREMONIES.

After laying in a supply of fresh provisions we left Sandy Point on the morning of the 29th December, and proceeded to the eastward to begin the surveying work. Retracing our course through the second and first Narrows, we anchored, early in the evening, off Direction Hills, at about two miles and a half from the shore, and here we remained at rest during the 30th, Sunday, a bright day with a cold wind blowing. Next morning we shifted berth farther into Possession Bay, anchoring nearly opposite a spot where a stream of water runs into the sea. In raising the anchor, a star-fish (*Asteracanthion*), and a fragment of a thin flat sponge, were brought up and consigned to spirits. At an early hour two surveying boats, with three officers, about a dozen men, and

a supply of provisions calculated to last for about ten days, were despatched to the opposite Fuegian coast; and some hours later two other boats, in one of which was Captain Mayne and an officer who acted as his assistant, left the ship for the neighbouring Patagonian shore; the arrangement being, that Captain Mayne was to undertake the triangulation of the coast, while the officer in command of the second boat, which was the steam-cutter, was to be employed in taking soundings. Leaving the ship in the steam-cutter about one P.M., I joined the shore party. On my way to the land I noticed a considerable number of penguins and cormorants on the water. The latter swim with almost the whole of the body beneath the surface, the head and neck in general alone being visible; and when in this position they are difficult to shoot, as they dive at the flash of the gun. When on the wing, they are, on the contrary, very readily knocked over, as they commonly fly very close to a boat, apparently possessed of a spirit of great curiosity as to the strange animals on board. In flying they generally keep low down in the air, and flap their wings very rapidly, producing a sound somewhat resembling a distant locomotive.

Many terns were flying about over the water, and a portion of the beach was whitened by a great flock of gulls. Immediately above high-water mark, where the shingle and the turf met, a broad light-blue belt, extending for many hundred yards, formed a prominent object, presenting the appearance of a bed of blue flowers; but a nearer view of it showed that it was composed of a thick bank of dead mussel-shells. On landing I met Captain Mayne and his companion, and set out with them on a walk to Direction Hills, a few miles distant. Close to the beach two plants that I had not previously observed were growing plentifully. One of these

was the *Adesmia boronioides*, belonging to the order Leguminosæ, with stems about eighteen inches high, pinnate leaves, and bright yellow flowers, minutely streaked with brown in the heart. The whole surface of the plant, with the exception of the petals, was covered with large glands, from which a viscid substance, with a very aromatic balsamic odour, exuded. The other plant, also highly viscid and aromatic, was a shrubby composite, from one to three feet high, with the general aspect of a dwarf cypress or lignum vitæ, very small scale-like leaves, arranged in fours in an imbricated manner, and small yellow flowers. This was the curious *Lepidophyllum cupressiforme*, originally described from specimens procured by the distinguished Commerson. It is a remarkable circumstance that two plants, both viscid, and both possessing the same aromatic odour, though belonging to very different orders, should be met with side by side. The *Adesmia*, though previously collected in Patagonia, does not appear to have been met with by any botanist in the Strait, and the *Lepidophyllum*, despite its peculiarity, has received a very small measure of notice from the various navigators through the Strait, as the only book, not of a strictly scientific nature, in which I have found it mentioned is the "Relacion del último viage al Estrecho de Magallanes de la Fregata de S. M. Santa Maria de la Cabeza en los añ̃os de 1785 y 1786," published at Madrid in 1788. The aromatic odour of the plants is so powerful, that we several times subsequently smelt it after a shower of rain, when we were lying at anchor more than half-a-mile from the shore.

On ascending Direction Hill, a low eminence about 200 feet high, I met with two additional plants, one of which was a low, stiff-growing shrub, with lilac flowers, smelling like daphne, and the other a curious little dwarf *Calceolaria*, the

Leaf of the Winter's Bark

Calceolaria nana

C. nana. This pretty little species, which belongs to a section of the genus confined to the Chilian Andes, Southern Patagonia, and Eastern Fuegia, has three or four small radical ovate leaves, from the midst of which arises a flower-stalk from one to two inches in height, bearing in general a solitary large flower, with a small upper lip, and a wide opening into the slipper-like portion. The ground colouring of this flower is yellow, beautifully freckled with dots and blotches of rich reddish-brown, and there is a thick white under lip, of so much firmer consistence than the rest of the flower, that it often cracks transversely in pressing the specimen for the herbarium. The plant is widely distributed over the open country in the north-eastern portion of the Strait, occurring alike on the Patagonian and Fuegian coasts, and presents a very handsome appearance when aggregated in masses.

After we had reached the summit of the hill, and while Captain Mayne was engaged with his theodolite, I occupied myself in strolling about the neighbourhood in search of plants, obtaining, among others, an odd little leafless jointed species, probably belonging to the order *Polygonaceæ.* I also collected a few species of Coleoptera, including representatives of the Heteromerous genera—*Emalodera, Platesthes,* and *Nyctelia ;* and one of the Lamellicornes—the *Taurocerastes Patagonicus.* Several of these species afterwards proved to be new to the national collection at the British Museum. A very rare Hymenopterous insect was also captured by the officer assisting Captain Mayne. This was the *Chirodamus Kingii* of Haliday, of which that distinguished hymenopterist, Mr. F. Smith of the British Museum, had previously only seen a single specimen, the type of the species. I noticed a moth flying about from flower to flower, in broad daylight,

after the fashion of our British *Plusia Gamma*, but did not succeed in taking it.

We remained on the top of the hill till about seven P.M., and then began slowly to retrace our steps to camp. It was one of the most perfectly beautiful evenings that I have seen; and as the sun gradually declined, the vast undulating grassy plains were displayed in golden light and delicate shadow, while later in the evening the sunset clouds were gorgeous beyond description, exhibiting the richest shades of orange, purple, and rose-colour. In the course of our descent I found specimens of a little Labiate plant, smelling strongly of peppermint, and our attention was arrested by a number of openings in the ground, wide enough to admit the forefinger, and lined from the entrance to about two inches downwards with a grayish silky substance. The bottom of this excavation, which I afterwards found was the work of a spider, proved, on digging, to be more than a foot below the surface of the ground. Arrived at the tents, in the neighbourhood of which many whitened bones of guanacos and feathers of ostriches were lying scattered about, we had our dinner, after which we spent some time lying luxuriously stretched out on a robe, enjoying our old friend *Martin Chuzzlewit*, and other works of a like nature. The evening was finally brought to a close by a long talk by our camp fire, which, fed by barberry bushes, made a glorious blaze, revealing our position to our friends on board; and, after discussing how our friends in England were likely to be engaged on this the last night of 1866, we retired to rest about eleven o'clock.

The morning of New Year's Day, 1867, was celebrated by getting up at half-past four o'clock, and after a refreshing bathe and breakfast, we started on a long walk over the low ground in the direction of the first Narrows. Leaving

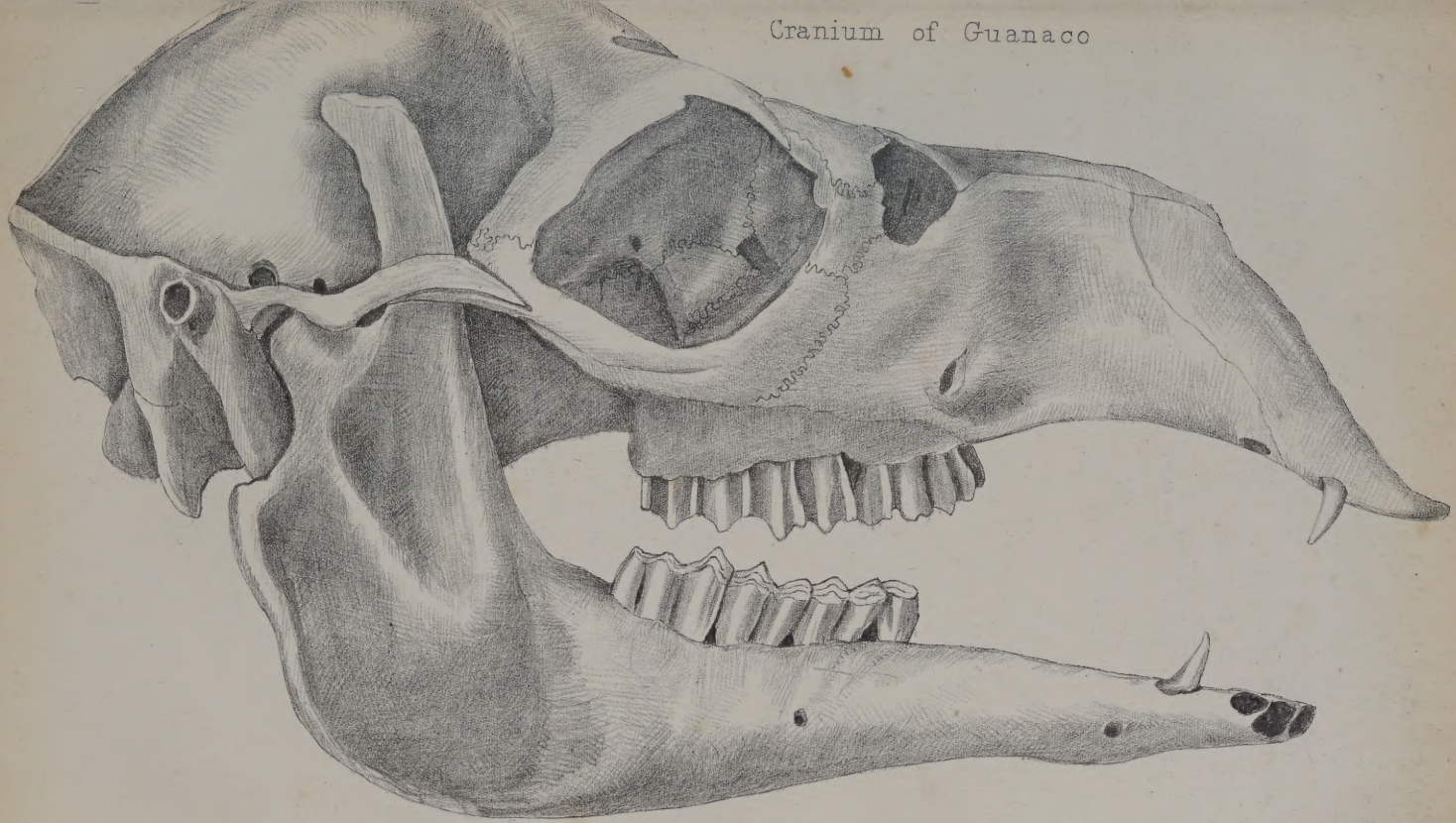
my companions when they had fixed upon their first station for observations, I pursued my solitary way along the beach in search of marine animals. The tide was low, and a great mud flat, known as the Direction Bank, stretched out for a long distance seaward. Over a considerable portion of this I struggled with some difficulty, owing to the extreme slipperiness and tenacity of the mud, on the surface of which I occasionally measured my length; but, with the exception of a few Algæ and Molluscs, and a curious Isopodous crustacean, the *Edotia Falklandica*, I got but little for my pains. After this I walked along for some distance, a little below high-water mark, observing great numbers of the sterna and other bones of cormorants, as well as fragments of the carapace of *Lithodes antarctica*, and another species of the same genus, lying scattered about. While thus occupied, I suddenly discovered, to my surprise, at a considerable distance from me, several large dark-brown objects moving along the shore, and occasionally stooping down to pick up something. My first conjecture was, that these were Patagonians; but judging it advisable to make certain of the fact before reporting it to my companions, I resolved to approach as near as I could to them without being perceived. I accordingly left the beach, and after ascending a steep bank to an elevation overlooking the neighbouring plain, beheld not Patagonians, but a herd of between fifty and sixty guanacos, which were speedily joined by several others from the beach, which, I suppose, must have been engaged in licking the salt from off the masses of kelp lying scattered there. As I could not have approached them from the situation where I was without frightening them away, I returned to where I had left the surveying party to inform them of the circumstance, but found that they had left the station and

proceeded some miles farther on. On my way to join them, I found nearly the entire skeleton of a large puma (*Felis concolor*) lying, with the skin still adhering to the head and paws; and elsewhere on the beach I met with two large skulls of Cetacea. One of these, which was in a beautiful state of preservation, I regretted much I could not carry off with me, as it measured fully three feet in length. I at last encountered the surveyors, superintending the building of a cairn to support a flagstaff, and that operation completed, we returned to the first station, and there had luncheon. While thus engaged, a number of guanacos appeared on the brow of Direction Hill, and contemplated us with much apparent curiosity. On our attempting to approach them, however, they made off at a rapid trot. Soon after this, as the evening was rapidly advancing, we returned to camp, and the rest of our waking hours were spent in dining, reading, and conversation.

As this was the first occasion on which we had seen the guanaco in the wild state, I will conclude the record of this day's proceedings with a brief account of its history. I may begin by observing, for the benefit of such of my readers as may not possess an acquaintance with it, that it forms one of two species* of the ruminant genus *Auchenia*, in general included in the same family with the camel, which it resembles in various points (as, for example, the possession of canine teeth in the upper and lower jaws), and that it is widely distributed throughout the length of the South

* In limiting the number of species to two (*i.e.* the guanaco and vicugña), I am of course aware that there has been much contrariety of opinion on the subject, and that some zoologists regard the paco or alpaca as distinct; but I think a careful consideration of all the evidence that has been adduced tends to show that the latter animal is only a well-marked variety of the guanaco.

Cranium of Guanaco



American continent, extending from the southern extremity of Fuegia, over the greater part of Patagonia, and along the chain of the Andes, at least as far as the northern parts of Peru. The earliest mention of it as observed in Patagonia occurs in the narrative of Antonio Pigafetta, who accompanied Magellan on his celebrated voyage. It is there mentioned that the Patagonians, whom they encountered at Port St. Julian, were clothed with the "Skinne of a Beast sewed together," and that "This Beast (as it seemed vnto vs) had a large head, and great eares like vnto a Mule, with the body of a Camell, and tayle of a Horse." The next reference appears to be in Oliver van Noort's voyage, where it is stated that at Port Desire they "found Beasts like Stagges and Buffals." In Schouten's voyage, at the same locality, "beasts like Harts, with very long neckes, which were afraid of us," are recorded as having been seen; but the first English navigator to take detailed notice of them, appears to have been Wood, to whose *Voyage through the Streights of Magellan*, in 1670, I have already referred more than once. In his narrative he observes that at Port Desire "the Land is dry and barren, but there is Plenty of Winnackews or *Spanish* sheep, which are as large as our *English* Deer, and wild;" and that at Port St. Julian "there are many Deer, or Sheep, which the *Spaniards* call *Wyanaques*, being a large sort of an Animal, about twelve Hands high. Their Heads and Necks are long like unto a Camel's, but their Bodies and hinder Parts resembling very much those of an Horse. We found them to be very watchful and shy, but we killed seven of them in the Time we lay here, and found their Wool to be the finest in the World. You may see a Drove of six or seven hundred of them together, which, upon their discovering of you, will make a Snort, and neigh like a Horse; but we

should have made a better Hand of them had we but Dogs to run them down."

In recent times we owe the fullest accounts of the guanaco, as noticed in the Strait of Magellan, to the narratives of King, Fitzroy, and Darwin, whose observations of its habits coincide in nearly all respects with my own. It is, as the last-named author truly remarks, a very elegant animal, being possessed of a long, slender, gracefully-curved neck, and fine legs. It is not easy to describe its general appearance, which combines some of the characters of a camel, a deer, and a goat. The body, deep at the breast but very small at the loins, is covered with long, soft, very fine hair, which, on the upper parts, is of a kind of fawn-colour, and beneath varies from a very pale yellow to the most beautiful snow-white. The head is provided with large ears, in general carried well back, and is covered with short grayish hair, which is darkest on the forehead. Occasionally the face is nearly black. As a rule, it lives in flocks of from half-a-dozen to several hundreds, but solitary individuals are now and then to be met with. They are very difficult to approach sufficiently near to admit of an easy shot, as they are extremely wary, and, on being disturbed, canter off at a pace which soon puts a safe distance between them and the sportsman, even though he should be mounted. Despite their timidity, however, they are possessed of great curiosity, and will sometimes advance within a comparatively short distance of an unknown object, at which they will gaze fixedly till they take alarm, when they effect a speedy retreat. On one or two occasions, when standing motionless or sitting on the ground, I have been within little more than ten yards of a guanaco, which was evidently puzzled by my appearance. Their cry is

very peculiar, being something between the belling of a deer and the neigh of a horse. When at a distance, and fired at with the rifle, they in general go through some very singular antics, ducking down their heads, and as it were falling on their knees on the ground—a habit which often at first induced our men to suppose that they were severely wounded, when they were in reality perfectly intact. Mr. Darwin has commented on the singular habit which they possess of depositing their droppings on successive days in the same defined heap, and this I have likewise frequently observed. It would be difficult to over-estimate their numbers on the Patagonian plains; for in whatever direction we walked we always came upon numbers of portions of their skeletons and detached bones. Their two principal enemies are the Patagonian Indians and the puma, as they constitute the principal food of both. The flesh is somewhat dry, and with very little fat, but is very palatable, particularly in the absence of other fresh provisions; and the skin is invaluable to the Patagonians, as furnishing the material of which their long robes are constructed. Occasionally bezoar stones are to be met with in the stomach, which are regarded by the Patagonians as of medicinal value.

On the morning of the 2d of January we again arose at an early hour, and while the surveyors were engaged in their work, I took a long walk into the plains by myself, and from the brow of a low hill gained another view of a herd of guanaco, which allowed me to approach them, creeping on all fours, to within about a hundred yards, and then made off. On joining the surveying party soon after noon, I found that one of the men had killed a small quadruped new to us. This was the chinche, zorillo, or skunk (*Mephitis Patagonica*), a beautiful little animal about a foot long, with a bushy tail; of

a rich dark brown colour, with two longitudinal white stripes on each side, and possessed, like the other species of the genus, of an insufferable odour arising from the fetid fluid which it has the property of discharging at its enemies. I regret to state, that my zeal for science was not sufficient to induce me to preserve the skin, as the operation would have involved my being regarded in the light of a leper for some time to come. As illustrative of the persistence of the odour of the animal, I may mention that the cap of its destroyer, which had happened to come in contact with it, was for ever afterwards rendered useless. Captain Wood appears to have been greatly struck with the animal, as he says, "I cannot pass over without mentioning a little Creature with a bushy Tail, which we called a *Huffer*, because, when he sets Sight on you, he'll stand vapouring and patting with his Forefeet upon the Ground." And he goes on to describe, in terms more forcible than elegant, the method in which it discharges the fetid fluid, which, he says, has "the most abominable Stink in the World." Captain King has remarked of the *Mephitis suffocans*, or yaguarè, from which the *M. Patagonica* is perhaps doubtfully distinct, "that he has frequently found the scent of this offensive little animal distinctly perceptible when he was on board the 'Adventure,' lying at anchor about two miles from Monte Video, with the wind blowing from the land."

On our way back to camp, early in the afternoon, a fox was seen; but we did not succeed in securing it. Two species of fox are common in the Strait, the *Canis Magellanicus* and *C. Azaræ*. The former of these, common also in Chili, is considerably the larger, rather exceeding our British fox in size. It has the back varied with black and white, the sides sprinkled with different shades of reddish-brown, and the lower

parts dirty yellowish-white. In the latter species, which is also met with in South Brazil and Paraguay, gray of various shades is the prevailing tint. Later in the season we had a young specimen of it, which the governor of Sandy Point had presented to Captain Mayne, for some months on board. It was at first suffered to go at large ; but in consequence of abusing its privileges in this respect by making an end of an unfortunate goose, it was chained up, and only allowed to go free now and then, when it could be carefully watched. The games of play that used to go on between it and a very intelligent dog that we had for some time afforded us much amusement ; and the contrast exhibited by the characters of the two animals was very striking—the dog being always perfectly good-natured, while his companion was ever ready to snarl or bite when annoyed.

As Captain Mayne thought it advisable to return on board that evening, the tents were struck early in the afternoon, and we embarked, skirting along the coast in the direction of the watering-place off where the ship lay. We essayed to land at one point in the bay, as the Captain was anxious to obtain a round of angles from a neighbouring elevation ; but the boat was nearly swamped in the endeavour, and the plan was therefore abandoned.

On our return on board, some time later, I was much pleased to find that my friend Dr. Campbell had obtained a haul of marine animals for me by means of the dredge, and among them specimens of two species which greatly interested me. One of these was a very fine Brachiopodous mollusc, the *Waldheimia venosa*, and the other a curious pedunculated Tunicate, a species of *Boltenia*. The latter (of whose singular form I give a sketch), which I frequently dredged in the eastern portion of the Strait on subsequent

occasions, and which also occurs at the Falkland Islands, belongs to a genus of which the first species described was found in the Arctic seas, and which appears to be specially characteristic of northern and southern temperate and cold latitudes. The test is generally thick and firm, and the apertures are cruciform or lozenge-shaped. The former mollusc I afterwards found to be abundant in the eastern portion of the Strait, particularly in Possession Bay; and I never dredged it to the west of Port Famine, where the largest specimen, which nearly equals one obtained by Admiral Sulivan at the Falkland Islands, and which has been described by Mr. Davidson, was procured. It is a very fine shell, smooth, with both valves rather convex, and of an oval form, and the largest specimen known (that in the possession of Admiral Sulivan) measures over three inches in length. Farther on in the season, I met with two other species of Brachiopoda, both occurring in considerable abundance—*i.e.* the *Waldheimia dilatata* and the *Terebratella Magellanica*; but neither of these species attains nearly such large dimensions as the *Waldheimia venosa*. The ribbed shell of the *Terebratella* varies much in form, being frequently considerably distorted.

On the following morning, Jan. 3d, I again left the ship on an excursion, accompanying one of the surveying officers, who had received instructions to examine that part of the Patagonian coast extending between Cape Possession and Dungeness Spit. Taking our departure between six and seven A.M., we proceeded rapidly on our way for a considerable distance under sail; but on nearing our destination the wind was against us, so that we did not succeed in effecting a landing on the beach, a little to the east of Cape Possession, till between three and four P.M., at the expense of a tough pull

on the part of the boat's crew. The prominent steep cliffs of the Cape are formed of hard clay, inclosing pebbles and boulders of various sizes, and are very deeply and remarkably furrowed, presenting at the base a series of cone-shaped buttresses, as if to withstand the force of the waves. On landing, we found many relics of old wrecks, including portions of masts and numerous planks and barrels, lying scattered about at high-water mark. As, after a careful scrutiny, we ascertained that there was no suitable place for pitching the tent close to the beach, we had our gear carried up a steep grassy bank to a plateau on a level with the summit of the cliffs; and, after dining, we walked along the high ground at the top of the Cape for some distance, my companion wishing to ascertain the most suitable spot for erecting a flag-staff. Sitting down, after a time, on the Cape, I watched the glories of the magnificent sunset on the waters of the Strait, not returning to the tent till the last trace of the red glow had died away on the horizon.

Next morning we rose early, and, after breakfasting, separated on our various avocations—my associate setting out with two of his boat's crew to walk along the top of the cliffs to the spot which he had fixed upon the night before for his station; while I descended to the beach, and walked some distance in an easterly direction, enjoying the bright sunshine and exhilarating air, and keeping a look-out for marine animals. I picked up a few specimens of hydroid sertularian polyps, the sternal apparatus of a condor, and a very large broad frond of a sea-weed, of the genus *Halymenia*, but obtained nothing of great importance. I then returned to camp, and passed some time watching the movements of two porpoises which were swimming lazily along near the shore. On the return of the surveying party about noon, they

reported that two condors had been seen flying about the top of the cliffs, and that one had been fired at and apparently wounded. Accordingly, soon after, I started to look for them, walking along the beach at the base of the cliffs. On coming nearly opposite the place where they had been reported as seen, I was much excited by suddenly coming within sight of no less than eight of these huge birds, half the number of which were perched on a shelf about midway up the cliff, which appeared to be habitually employed as a resting-place, as it was whitened with their droppings ; while the remaining four were sailing majestically about in the air, their wings widely extended and the pinions separated so as to produce a jagged edge at the tip. Although the gun which I had with me was only loaded with duck-shot, I felt impelled by an irresistible desire to get a shot at them ; and accordingly, at the expense of much labour and difficulty, managed to scramble up the lower part of the cliff by dint of planting my feet in the numerous waterworn gulleys in the hard clay. I had almost attained to within range of those on the shelf, when they slowly flapped their great wings and rose into the air, joining their companions, the whole party now soaring round in a circle above my head, gazing at me with malevolent faces, their whole aspect recalling to me the mythical descriptions of griffins. Although, in common with the rest of its tribe, the condor (*Sarcoramphus Papa*) is disfigured by a naked head, covered with mottled skin, it is a truly magnificent bird when seen in the wild condition and on the wing ; and one cannot be surprised that the most exaggerated accounts were given by the older travellers of the dimensions to which it attains—as much as eighteen feet having been sometimes assigned to the expanse of wing. It is widely distributed over the western

side of the South American continent, the Cordillera appearing to constitute its head-quarters. On the eastern side, on the other hand, it has a much more limited range—a steep cliff near the mouth of the Rio Negro, according to Mr. Darwin, being its northern limit on the Patagonian coast. He mentions Port Desire and the mouth of the Santa Cruz river, on the same coast, as localities where it is met with farther south; and we noticed it both at Port Gallegos and in several localities in the eastern part of the Strait of Magellan, almost invariably in the neighbourhood of steep cliffs.

By the time I left the Condor cliff it was nearly low tide, a broad expanse of wet sandy beach being thus uncovered; and as I crossed this, my attention was arrested by a number of horse-shoe shaped depressions, accompanied by neighbouring elevations in the wet sand. On digging into these with my hands, I was much interested to find a number of specimens of a live Volute. The body of the animal, which possessed a very large foot, was in all cases greatly protruded from the shell, and of a fine deep purple colour, with delicate ramifications of a lighter tint, while the under surface of the foot was yellowish-white. Other examples of the mollusc were met with upon the clusters of live mussels which covered many of the large stones on the beach, and were, I suspect, feeding on the bivalve, after the manner of the familiar *Purpura Lapillus* of our British shores. This volute afterwards proved to be the *Voluta Ferussacii*, of whose habitat naturalists appear to have been hitherto ignorant, though the species has been known for a long period. It appears to be very plentiful towards the eastern entrance of the Strait, judging from the numbers of dead and broken shells which I subsequently found on many of the beaches, but does not seem

to extend farther into the Strait than St. Jago and Philip Bays, where it is replaced by the *Voluta Magellanica*, a more elegantly formed, and more handsomely coloured species. A single small specimen of the latter was also taken on this occasion. The animal, which has been well figured in the Atlas of one of the French scientific expeditions, is of a much paler colour than that of the *V. Ferussacii*. The latter species appears to be endowed with considerable powers of vitality, as many of the specimens procured on this occasion were still alive on my return to the ship, though they had been kept tied up in a pocket handkerchief for nearly three days.

On my return to camp, a considerable amount of time was occupied in hauling down the boat to the water, which operation being at length accomplished, the gear was packed into her, and we embarked, with the intention of getting as near Mont Dinero, a small eminence about midway between Cape Possession and Cape Virgins, as time would permit. As a strong tide was running against us, we kept in shore to take advantage of the eddy, and this circumstance afforded me a good opportunity of observing the geological structure of the coast, which consists for the most part of high cliffs of a sort of boulder-clay, diversified here and there with sloping banks. The colour of the cliffs varied considerably in different places, owing to the prevalence of different strata of clay, and occasionally a restricted patch of a dark colour occurred in the centre of a whitish matrix. The imbedded boulders appeared to be of all sorts—limestone, greenstone, granite, etc.; and they varied in size from that of a pebble to a mass of several tons weight. Huge masses of the cliffs had here and there given way, and lay on the beach in angular fragments; and on the perpendicular face were a number of well-marked ledges and cavities (some of which were tenanted by condors), as

well as occasional damp patches, indicative of the presence of springs. The sun set with an appearance boding stormy weather, after we had proceeded for a considerable distance, and shortly before dark we landed opposite a broad interval between the masses of cliff, where the land gradually sloped down to the sea, and the beach was strewed with numbers of planks and other fragments of a wreck. The boat having been secured and the tent pitched on the top of a bank overlooking the Strait, and in the immediate neighbourhood of a rill of water, we had our supper and turned in for the night. We awoke between four and five next morning with the consciousness that a gale had set in, and that the tent was in some danger of being blown down about our ears; and rising speedily, we had the tent-pegs driven in, and lay down again, to be roused shortly after by the watch announcing that the sea had reached the boat. Knowing that if left where she was she was certain to be carried away or stove by the waves and that we would thus be left in no enviable predicament, all hands lost no time in rushing down to the beach to drag her up to a place of safety. This was at length accomplished, after nearly a couple of hours' severe exertion; and as, on returning to the tent, we found it almost blown down, we shifted our camp to a more favourable situation, fortunately succeeding in finding a very sheltered locality in a hollow behind a natural hedge of barberries, from six to eight feet in height, and nearly the same in thickness.

As there seemed no prospect of the gale abating, and consequently of our being able to rejoin the ship, for a day or two, we resolved on making ourselves as comfortable as we could on shore—a matter of no great difficulty, as, apart from the high wind, the weather was very fine, and we had no anxieties on the score of food, it being an invariable rule

throughout our service in the Strait that every surveying-boat leaving the ship should be provided with a supply of provisions sufficient to last for some days longer than was likely to be required. Early in the afternoon, therefore, we set out on a long ramble to the eastward, descending to the beach, and walking along at high-water mark. Here a strange wild scene presented itself, for on one side high steep cliffs, about which a couple of eagles were soaring, towered above us, and on the other was a mass of foaming billows; while at our feet lay scattered about numerous vestiges of former devastation, the shore being strewn for miles with fragments of masts and spars, and pieces of canvas. On our way we spent a considerable amount of time in endeavouring to ascertain the name of the ill-fated vessel; and at length arriving at a spot somewhat resembling our landing-place, where the land sloped down seawards, we discovered, half drifted up with sand, the remains of a wooden shelter built of planks and oars, evidently the work of the survivors of the disaster. We retraced our steps towards our camp later in the day, walking along the land at the back of the cliffs, which we found covered with long coarse grass, a low shrubbery of *Lepidophyllum*, and extensive thickets of barberries, evidently the occasional resort of pumas, as I found portions of skeletons of these animals lying about. We skirted along the edge of one or two marshes, which yielded me a few additions to my botanical collection, including several Graminaceæ; a Primulaceous plant, the *Samolus spathulatus*, with smooth spathulate, radical leaves, and pretty purple flowers; and the wild celery, *Apium graveolens*, which last I subsequently found to be widely distributed throughout the Strait and in the Western Channels. As has been remarked by Dr. Hooker in his *Flora Antarctica*, it is a very curious fact that this plant,

Cranium of Puma, Less than natural size

which possesses acrid poisonous qualities in the northern hemisphere, is perfectly innocuous and wholesome in its southern habitat. We were able to pronounce judgment on this point from personal experience, as we frequently ate it on our excursions, finding it to possess a very agreeable flavour, though of course it was not so crisp and succulent as the cultivated variety. Another plant that I observed for the first time on this occasion was the *Pratia repens*, a little Lobeliaceous plant, growing in sandy places, with a pale purple corolla appearing as if split down one side.

On the following day, during the greater part of which the gale continued to blow as violently as ever, we passed the forenoon reading in our tent, a fox paying us an occasional visit in search of plunder, but always succeeding in escaping without injury. About noon, some of the men, who had gone off on a stroll to the westward, returned with the news that there was the wreck of a large iron ship lying on the beach at some distance. We therefore walked down to the beach in the course of the afternoon to see her, and I have seldom witnessed a more eloquent demonstration of the feebleness of human workmanship as contrasted with the power of the elements, than she presented to our gaze as we approached her. She lay on the sand, broken into large fragments. Her bows still remained in one mass, the figure-head crusted over with mussels, and one of her anchors attached in readiness to be let go, while the other two, one of which yet retained its connection with her great chain-cable, lay half-buried in the sand. All around were scattered yards of galvanised iron rigging, and the remains of her cargo, consisting of sledge-hammer heads, flat irons, spades, shovels, pincers, bits, stirrups and spurs, together with her strong box, with the door rent off, and fragments of cups and plates, etc. The weather

exhibited symptoms of improvement in the course of that evening, and on the morning of the 7th, finding that the wind had gone down, we rose at an early hour, and having struck the tent and packed up our gear, embarked, and proceeded down the coast, by and by perceiving the "Nassau" in the distance, lying between Dungeness Spit and Cape Virgins, as well as another vessel, which we subsequently learned was a Yankee, the "Pensacola," passing along near the Fuegian shore. Both wind and sea got up before long, and we had in consequence a rather rough passage between Mont Dinero and Dungeness. Numbers of a large black petrel were flying about, and on the gravelly beach of the last-named locality great flocks of gulls, terns, and cormorants were assembled, and took wing on our approach. As we observed a party of human beings on the Spit, we landed to see who they were, and found, to our surprise, that two of the three officers who had been engaged in surveying the Fuegian coast, and whom we had not expected to see for some time, were among the number. From them we learned that their expedition had not been so fortunate as could have been desired, as they had had a fray with Fuegian Indians, who had attempted to help themselves to various articles in the boats, and on being repulsed, had attacked our friends with their bows and arrows, one of the officers receiving a rather severe wound from an arrow in the back of his shoulder. This circumstance, I need hardly state, was a matter of general regret to us all, as we regarded it as an inauspicious beginning to our work on the Fuegian side; and so the event proved, for the natives of that portion of the Fuegian coast steadily avoided holding any intercourse with us on subsequent occasions, while, at the same time, they kept a sharp look-out on all our movements, which necessitated the use of caution in landing surveying parties.

These savages, of whose habits and customs much less is known than those of the Fuegians in the southern and western parts of Tierra del Fuego, appear to constitute a very distinct tribe confined to the northern part of the large eastern island, the climate and productions of which differ very considerably from the remaining portions of the archipelago—the rainfall, at least in the northern portion of the island, being comparatively small, and the country abounding in grassy plains, presenting a close resemblance to those of eastern Patagonia, and characterised by the presence of the same animals and plants. They differ strikingly from the western tribes in their much larger stature, and in their manner of life, which approximates, in some particulars, to that of the Patagonians, as they engage in the chase of the guanaco (the flesh of which appears to be their principal article of diet, although they do not disdain shell-fish), and whose skin furnishes them with garments in the shape of long mantles, like those of the Patagonians, but worn with the hair outermost instead of innermost. Fitzroy justly remarks that this tribe, whom he terms the Yacana-kunny (believing them to be the people described by Falkner under this title), "seem to be now much in the condition in which the Patagonians must have been before they had horses;" and adds that, "with their dogs, with bows and arrows, balls (bolas), slings, and clubs, they kill guanacos, ostriches, birds, and seals." He also mentions that they frequently make incursions upon the Tekeenica, another tribe in the south-eastern part of Tierra del Fuego, characterised by their small stature, and whose country is separated from that of the Yacana by a range of high mountains. He estimates their number as about 600, but he does not give us the data for this calculation, which, as the tribe is so little known, can be considered of very little value.

On our return on board in the afternoon of this day, I was shown a Fuegian bow and arrows which the surveying party had carried off from their assailants. The bow was short (about a couple of feet long), requiring a considerable amount of force to bend it; and the arrows, which were beautifully fashioned, were furnished with thin triangular heads with jagged edges, so united to the shaft as to be readily detached when an object was struck. One of these heads was of flint and the other of rock-crystal. In general form these weapons did not materially differ from those we observed at a subsequent period in the possession of the western tribes.

On the 8th we remained at anchor all day, a party landing and spending some hours in surveying operations at Cape Virgins. My time was fully occupied in stowing away the specimens obtained during my excursion, and in endeavouring to remedy the state of confusion into which my collections, etc., had been thrown by the gale during my absence. One of the men who had been on shore brought me a portion of a condor's skeleton, and the dredge yielded a few ascidians and encrusting corallines, as well as numbers of a species of *Calyptræa*, the *C. costellata* of Philippi. In the evening a remarkable light was seen off the Fuegian shore. Next day the ship was employed taking soundings at the eastern entrance of the Strait, and we anchored in the evening off Catherine Point or Queen Katherine's Fore-Land, as it was originally named by Wood, a low and shingly projection on the Fuegian coast, presenting a considerable resemblance to Dungeness Spit on the opposite side. On the morning of the 10th some fine Tunicata and a few Tubicolous Annelids were taken in the dredge. Sounding was again the order of the day till early in the afternoon, when we returned to our anchorage, and a party landed to take angles and erect a

beacon. I availed myself of this opportunity of setting my foot for the first time on the Fuegian shore, accompanying Captain Mayne, who was ever ready to afford me all the facilities in his power for the prosecution of my work. On our way from the ship, a small whale passed very near us, spouting at intervals. Our landing was accomplished with much difficulty, owing to the violence with which the surf broke on the steep shelving beach ; and we were well wet in the process. The shore was formed of small, rounded stones, exhibiting several distinct terraces ; and as the tide fell, a muddy flat was disclosed, on which were large beds of mussels, affording a feeding ground for numbers of gulls, sand-pipers, and oyster-catchers, the last of whom appeared to take great exception to our presence, flying about in wide circles and screaming. Two species of *Hæmatopus*, I may here observe, are common throughout the Strait of Magellan, and on the west coast of South America as far north as Chiloe. The plumage of one of these (*H. ater*) is wholly black, while that of the other (*H. palliatus*) is pied with black and white, so as closely to resemble the British *H. ostralegus*. We found them both to be very good eating, and they were therefore entered in the game-book which was kept by one of our number as a register of the skill of the sportsmen. Like many other *Grallæ*, they are possessed of tolerable swimming powers.

At high-water mark numbers of broken and worn Volutes (*V. Ferussacii*) were lying about, some of them very large and strongly formed ; and at a short distance from the beach I collected a few plants, all of which, however, with the single exception of a small purple-flowered labiate, the *Scutellaria nummulariæfolia*, I had previously obtained on the northern shore of the Strait. After spending some hours on shore we got on board late in the evening.

On the 11th we left our anchorage in the morning, and were engaged for some hours in taking soundings, anchoring again off Cape Espiritu Santo, on the coast of Fuegia. Here I again accompanied a surveying party on shore, as I naturally was anxious to leave no spot that was accessible to me unvisited. Owing to the nature of the beach, and the surf upon it, we were compelled to get out of the boat and walk through the water for some distance. The cape resembles Cape Virgins on the Patagonian shore, in presenting a face of high bold cliffs, which, from their white colour, are visible at a long way off; and the stratification of these cliffs is very distinct, their lower and larger half being formed of strata of soft pale yellowish-white sandstone, and their upper of the hard clay abounding in boulders so common on the Patagonian coast. Two large hawks were sitting on their nest built halfway up on a ledge, and a couple of eagles were seen flying about not far off. Leaving my companions engaged in taking their observations on the summit of the cape, I walked along the smooth sandy beach which extended beneath it for about a mile, looking for live Volutes. My search proving fruitless, and nothing of interest being to be met with, I after a time scrambled up to the high ground above the shore, soon observing my friends in the distance making energetic signals to me. Accordingly, I quickened my steps to ascertain the cause, which, on reaching them, soon became apparent, as they pointed out to me that groups of Fuegians were making their appearance on the neighbouring rising grounds, which rendered it highly imprudent for any one, entirely unarmed as I then was, to stray far from the party. We remained for a few minutes on the top of the cliff, watching the movements of the natives, and I was struck by the bright purplish appearance presented by some of the hollows in the land. This I subse-

quently found was due to the presence of a grass of the genus *Hordeum;* in other words, a species of wild barley. On our way back to the boats a couple of guanacos were observed at about 500 yards' distance, and afforded some scope for rifle-practice. A very large Fuegian dog with long dark brown hair was also seen wandering about, apparently perplexed by our appearance. Soon after we embarked, walking waist-deep into the water to reach the boat, and we got on board at three P.M., soon after which one of the men brought several small Crustacea which he had found adhering to a fishing line. These proved to belong to the Isopodous genus *Edotia,* of which they appear to constitute a new species, which I have named *E. Magellanica.* Later in the day we returned to the anchorage between Dungeness and Cape Virgins.

On the 12th we continued at anchor all day, and I remained on board busily occupied with the examination of my zoological and botanical collections. In the morning some very large simple Ascidians were taken in the dredge. These belonged to the genus *Cynthia,* apparently forming the type of a new species, which I have named *C. gigantea,* on account of its great size—one specimen subsequently obtained in Gregory Bay measuring no less than eight inches from base to apertures. Upon one of these *Cynthiæ* was a small pedunculated Cirriped of the genus *Scalpellum.* Soon after this one of the ship's boys brought me a most wonderful specimen in the shape of a mass of a social Tunicate, about a foot and a half long, attached to a stone. The animal-mass was of a vivid scarlet colour, and consisted of hundreds of animals imbedded in cells in the circumference of a fibro-gelatinous matrix. I subsequently met with it in great abundance in various localities in the eastern portion of the Strait, as well as at the Falkland Islands ; and it appears to

form the type of a new genus, for which I have proposed the name of *Goodsiria*, in honour of a late distinguished anatomist.

Later in the day, one of the officers brought me a small specimen of a shark of the genus *Acanthias*, which he had taken in a pool in Dungeness Spit. In general form and colouring it very closely resembled our commonest British dogfish;* and attached to each side of its head was a parasitic crustacean of the genus *Chondracanthus*, or some closely-allied form. From Dungeness also Captain Mayne brought me a great prize in the form of a magnificent cranium of a sea-lion (*Otaria jubata*). This great seal, to which I shall often refer in the course of this narrative, is widely distributed around the western and southern coasts of the South American continent, frequently congregating in large herds on the beaches. Despite its huge size, and the formidable teeth with which it is armed, it appears on the whole to be a very peaceable animal, it being the general testimony of those voyagers who have observed its habits that it will not attack its assailants, thus differing greatly from the walrus of the northern seas, which, when irritated or wounded, is a dangerous enemy to boats. As Cook has well observed, the only danger to be incurred from a herd of sea-lions is by getting between them and the sea, as, if alarmed, individuals in their way would be liable to be run over.

In the evening, a party who had made an excursion to the iron wreck returned to the ship, bringing with them several birds of which I had not previously obtained specimens. Among these was a fine male example of the

* Since the above was written, Dr. Gunther has informed me that it is identical with our common *Acanthias vulgaris*.

military starling (*Sturnella militaris*), a beautiful bird, with a bright red breast, widely distributed over South America, and generally occurring in open plains, where it is to be seen in small flocks. It is common both in the eastern part of the Strait and at the Falkland Islands, and I also observed it in Banda Oriental and Chili. Another bird procured on this occasion was the *Upocerthia dumetoria*, which also possesses a wide range, frequenting much the same localities as the military starling, and concerning which Mr. Darwin has made a curious observation—namely, that in specimens from different localities the beak varies much in length, a circumstance which has also been remarked in specimens of another bird, to be afterwards noticed, the *Cinclodes Patagonicus*, which also has an extended range.

On the following day, which was Sunday, we remained at rest at our anchorage. There was a very fine sunset, the most marvellous red and green tints lingering long on the horizon. A little rain fell in the course of the evening, a comparatively rare phenomenon, as our subsequent experience showed, in the eastern part of the Strait, where frequent gales constituted *the* great obstacle to be encountered in carrying on our work.

The morning of the 14th was magnificent—clear, bright, and perfectly calm. The day was occupied in sounding the Sarmiento Bank, which stretches across outside the entrance of the Strait. Early in the afternoon, while at work in my cabin, I was summoned to see the extraordinary number of birds around us, and, on ascending to the bridge, I beheld a most remarkable spectacle. As we steamed slowly onwards, numbers of albatrosses and large black petrels rose lazily out of the briny element, where they were resting at only the distance of a few feet from the side of the vessel ; and flocks of

penguins jumped out of the water in the most absurd manner, throwing their hind quarters in the air, and plunging in again, head foremost, after the manner of porpoises. The sunset was again very beautiful, the calm surface of the sea, which was of a pale emerald tint, exhibiting rosy reflections of the clouds.

The early part of the 15th was likewise very fine, and the sounding of the Sarmiento Bank was continued. In the afternoon we encountered a curious kind of fog-bank, which came down from the northward, completely enveloped the ship for about ten minutes, and then passed away to leeward, leaving all to windward as clear as before. This occurred two or three times in rapid succession; and after we had anchored in the evening we saw several more of these fog-clouds pass over the Sarmiento Bank, though they did not reach us. We anchored on this occasion on the western side of Dungeness. The 16th was also occupied in sounding. A number of bridled dolphins (*Delphinus bivittatus*) appeared in the vicinity of the ship, and we saw them on several subsequent occasions; but, greatly to my regret, I had no opportunity of examining a specimen of the species. In the evening, when we were lying at anchor in Possession Bay, a large fire was observed, extending for more than half-a-mile along the coast. This we supposed at the time to be the work of Patagonians, but we afterwards found that it had been lighted by a party from Sandy Point, who wished to attract our attention.

On the morning of the 17th the dredge yielded live specimens of *Lithodes antarctica*, and of *Peltarion spinulosum*, some *Holothuridæ*, *Terebratulæ*, Tunicata, and sponges, as well as a variety of Algæ. Here I may observe, that while we were in the eastern portion of the Strait, a consider-

able number of sea-weeds were taken in this manner, including the beautiful *Delesseria Lyallii* and *Ptilota Harveyi*, species of *Plocamium*, *Polysiphonia*, etc. etc. Preparations were made in the evening for the despatch of a couple of surveying parties, one of which I was to have accompanied; but on the morning of the 18th it was blowing so hard as to render it impossible for any boat to leave the ship. On the 19th, on a piece of *Macrocystis* which was hooked, I found many live specimens of a molluscan bivalve, afterwards obtained very plentifully in many localities in the Strait and Western Channels. This was the *Modiolarca trapezina*, the shell of which varies in tint from light straw-colour to dark olive-green. The animals adhered to the fronds of the "kelp" by a process of a tough gelatinous substance. In the afternoon three of the officers took advantage of a lull to go on shore close to Direction Hill to watch the tides. It came on to blow soon after their departure, and continued blowing all next day; and for some days the weather remained too unsettled to admit of surveying operations. On the 23d the tide-watching party returned to the ship, bringing with them a lot of marine animals in a bucket. Among these were specimens of a fish of the genus *Notothenia* (*N. virgata*), some long-legged crabs (species of *Eurypodius*), a few Annelida, and some fine starfish of the genera *Uraster*, *Asterina*, and *Ganeria*. The *Ganeriæ*—referable, I believe, to *G. Falklandica* (Gray)—were exceedingly beautiful specimens, of a rich carmine colour. The wind lasted throughout the day; but on the 25th we had an interval of calmer weather, which we employed in passing through the first Narrows, where we met a small vessel, the "Zeta" of Swansea, on her homeward way. We anchored early in the evening in St. Jago Bay, and, as the weather appeared more

propitious, preparations were made for despatching boats next morning; but on the 26th it was again blowing so hard that we were detained prisoners on board.

At length, on the morning of the 28th, the wind appearing to have expended itself for the present, four boats left the ship on surveying work. On this occasion I accompanied Captain Mayne, who was engaged in the triangulation of the coast of the first Narrows. We landed nearly opposite the vessel, which was at this time lying about three miles from the shore, opposite a little hill where we erected a beacon. On the high banks near the beach I again found *Adesmia boronioides* and *Lepidophyllum cupressiforme* in abundance, as well as two yellow-flowered species of *Senecio* and the blue *Homoianthus echinulatus;* and at the edge of a neighbouring marsh *Samolus spathulatus*, an *Epilobium*, and a yellow *Sisyrinchium*, were met with. On the banks of a small fresh-water lake in the vicinity several geese were seen, and stalked, but unsuccessfully. This species, the Upland goose (*Chloephaga Magellanica*), is very plentiful in the eastern portion of the Strait of Magellan, but is very seldom to be seen much to the west of Port Famine. It is also very abundant at the Falkland Islands, and is common on the lower slopes of the Chilian Andes. In the Strait of Magellan it breeds in numbers, on Elizabeth, Sta. Magdalena, and Quartermaster islands. The plumage of both male and female birds, as all those who have had an opportunity of seeing them in the Zoological Society's Gardens will, I think, agree with me, is very handsome—that of the male being white, with narrow black transverse bars on the feathers of the back and breast; while that of the female is chiefly composed of various shades of brown, the feathers being also barred with black. Mr. Darwin, in his notes on

this species, remarks that "at the Falkland Islands they live in pairs and in small flocks throughout the interior of the island, being rarely or never found on the sea-coast, and seldom even near fresh-water lakes"—an observation from which my experience widely differs, as I never saw them either at the Falkland Islands or in the Strait, at any considerable distance from the sea; and I frequently observed them on the banks of small lakes of salt and fresh water. Possibly this discrepancy may have resulted from their having been noticed at different periods of the year.

After spending a short time at the edge of the small lake above mentioned, where I found a yellow-flowered Boraginaceous plant, new to me, we re-embarked, and skirted eastwards along the coast for some distance, a breeze springing up before long, and gradually freshening. At noon we landed on the lee of a long, low, gravelly spit, on which a number of black and white oyster-catchers were settled, but which took wing before we had time to get a shot at them. A fire was here kindled with some trouble; and while the boat's crew's dinner was getting ready, we investigated the neighbourhood, finding, as usual, numerous boards and spars scattered about, as well as a signal-post formed of a piece of plank nailed to a small mast planted firmly in the ground, and probably erected by shipwrecked sailors to attract the attention of passing vessels. As the breeze was rapidly freshening up into a gale, Captain Mayne judged it best for us to remain where we were till the weather moderated. The boat was accordingly hauled up, and a suitable locality selected for our camp. After this we ascended a low hill, where it was thought desirable to take some observations; but on reaching the summit, we found that it was blowing so violently as to render work impossible,

and accordingly descended without loss of time, occupying the remainder of the afternoon in a walk down the coast, to ascertain the position of one of the boats which had been appointed to work in concert with us. After struggling along for some miles, with a stinging shower of fine sand driving in our faces, we had the satisfaction of seeing the boat in question lying in a sheltered locality, and accordingly turned our faces homewards, finding on our return to camp the men still engaged in laboriously struggling to pitch the tents, a most difficult process, owing to the violence of the wind. At length, however, this was successfully accomplished, and, comfortably housed, we passed a pleasant evening in reading and conversation.

Next morning (29th) we rose about 4 o'clock, finding the gale as violent as ever; and after we had breakfasted, I strolled about the neighbourhood, while Captain Mayne and his assistant were at work with the theodolite. At one spot I came within twenty yards of a guanaco, which remained stock-still, gazing at me for a few minutes with apparent surprise, and then made off. On the beach many large masses of the curious social Ascidian I have mentioned a few pages back were lying, together with numerous fragments of the skeletons of birds, nine-tenths of which were those of cormorants, readily identified even when the skull was absent, which was generally the case, by the peculiar form of the breast-bone. Early in the forenoon we set out on a walk of about eight miles down the coast of the Narrows, a most fatiguing exploit, owing to the high wind and the uneven nature of the ground, which was everywhere raised into little hillocks by the tunnelling operations of a burrowing rat. These hillocks were in general surmounted by tussocks of grass, and were placed so close together that it was hardly possible to plant both one's

feet on a level space of ground at the same time, our experience in this respect being occasionally varied by suddenly sinking over the ankles in a burrow. This troublesome little engineer was the *Ctenomys Magellanicus*, a species closely allied to the burrowing rodent to which I have at an earlier period referred, as common in the neighbourhood of Maldonado. It is very abundant in the open country on the coast of both sides of the Strait, but, so far as my experience goes, does not penetrate far inland. Like the northern species, it emits a most peculiar cry while in its burrow, and it is much more frequently to be heard than seen, as it is very cautious on the approach of danger. Captain King appears to have been the first to procure specimens of it, and these were taken at Cape Gregory; but the occurrence of the species in the Strait was noticed more than a century before his time, by Wood, who remarks, that at the "first Narrow, the place for the space of five or six Miles, is full of Rats, that have holes in the Earth like Coney-Boroughs, and are supposed to feed on Limpids."

In the course of our expedition we observed a few snipe and many large carrion-feeding hawks. These birds, the carranchas (*Polyborus Tharus*), are extremely common on the grassy plains, and their vulturine habits, as Mr. Darwin has observed, "are very evident to any one who has fallen asleep on the desolate plains of Patagonia; for when he wakes, he will see, on each surrounding hillock, one of these birds patiently watching him with an evil eye." When thus perched, they assume a very erect posture, and I have frequently mistaken one in the distance for a human creature. The plumage is handsome, but the naked skin over the crop, which protrudes after a meal, communicates an unpleasant aspect to them, and they are exceedingly disagreeable to skin, as they

are invariably swarming with minute and very active Anoplura.

On our way back to camp, which we reached in the evening, pretty well tired out, an addled egg of a *Rhea* was picked up. Mr. Darwin has remarked, in his account of the habits of the American ostrich, that "the eggs lie either scattered or single, in which case they are never hatched, and are called by the Spaniard huachos; or they are collected together into a shallow excavation, which forms the nest." These single eggs we often met with on subsequent occasions, and once or twice we found the remnants of a nest. While on this subject, I may remark, that though on several occasions I had an opportunity of examining specimens of *Rheas* which had been killed, I never met with one of the *Rhea Darwinii* in Patagonia, although I frequently picked up its feathers on the plains. On the morning of the 30th, as the gale still continued undiminished in force, and our stock of water was waxing low, there being none to be procured in the neighbourhood of our camp, we set forth after breakfast, accompanied by two of the boat's crew, carrying barracoes slung on poles, and walked to the small lake close to which we had landed on the first day of our excursion. In the course of our route many guanacos and several gray foxes were seen, but none obtained. On the beach at one place, we observed the largest number of steamer-ducks ever noticed by us during the whole time we spent in the Strait. There were literally hundreds, and they produced a most singular spectacle as they ran into the water and paddled off. The wind fell considerably during the evening, so that we had a pleasant walk back to the tents, refreshing ourselves on the way with the fruit of the *Berberis dulcis*. By 10 P.M. it was nearly calm, and rain set in, lasting throughout the greater part of the night. Next morning

when we arose, shortly after 5 A.M., it was still raining slightly, but soon after cleared up; and the clouds breaking, disclosed a delicate pale green sky. By and by the sun shone out brightly, and we determined to avail ourselves of this opportunity to return to the ship. We accordingly started as soon as our gear was stowed in the boat, and reached the vessel about 9 A.M., soon after receiving a practical proof that we had taken a prudent step, as the wind again arose before we had been two hours on board. After the return of another of the boats we got under way, and attempted to steam on to Gregory Bay; but the wind by this time had become so strong, that after steaming for four hours, we had only accomplished about three miles, and therefore came to an anchor.

A fresh start was made early next morning, but little way gained, as the wind arose as usual, and kept us back. It blew hard throughout the whole of the 2d of February, and it was only on the morning of the 3d that we got fairly into Gregory Bay, and the two other boats were able to join us. One of the officers, Mr. Gray, who took a special interest in collecting marine animals, and was in consequence a most valuable ally, brought me some very fine specimens of a large Chiton (*C. setiger*) and a live individual of a bright green spider, apparently a species of *Epeira*, with its nest; while from another I received a fine specimen of the large owl (*Bubo Magellanicus*), first seen at Sandy Point. In skinning this bird on the following day (which was warm, bright, and calm, but with a thick fog, which for some time enveloped the ship), I was much struck with the exceeding development of air-cells in the back part of the cranium, and the extreme thinness of the outer and inner tables of the bone.

The morning of the 5th was fine, with but little wind, and the adjacent saddle-backed Gregory Range appeared very

beautiful as it lay in mingled light and shadow. During the forenoon we remained at anchor, as various of the boats were employed in sounding about the neighbourhood. It had been intended that we should pass through the second Narrows in the afternoon, but the wind again arose and defeated the plan. The 6th was, however, everything that could be desired as regarded weather, and we accordingly left our anchorage, and, passing through the Narrows, arrived in Royal Road, between Elizabeth Island and the mainland about noon. A few hours later, a large party of us landed on the island, and remained on shore until the evening. Most of the plants I found had gone out of flower, so that I did not succeed in getting many specimens of value ; but my companions had some good sport, shooting a number of oyster-catchers and upland geese, as well as a specimen of the large ibis which we had previously seen at Sandy Point. This bird (*Theristicus melanopis*) the *bandurria* of the Chilians (so called in consequence of its remarkable note being supposed to resemble that musical instrument), is common in the open country of Patagonia, as well as in Chili and the Argentine Republic. It is of large size, and possesses very handsome plumage—the upper parts, wings, and tail, being of various shades of gray, black, and dark green ; while the head, neck, and breast, are of a yellowish-buff hue. The bill and a naked gular space are black, and the legs dull red. The flight is very strong, and the bird requires to be heavily hit to bring it down. The cry is very peculiar and sonorous, and not easy to describe. It has been compared by Mr. Darwin to the neighing of a guanaco, but in this I cannot agree with him. Those specimens examined by the above-mentioned distinguished naturalist had "grasshoppers, cicadæ, small lizards, and even scorpions," in their stomachs ;

while, in those examined by me, caterpillars appeared to have been the principal source of aliment. On carefully examining the respiratory organs of an individual shot in January 1869, I found that the portion of the trachea below the insertion of the sterno-tracheal muscles, though presenting no striking peculiarity of form, had the rings anchylosed so as to form an immovable tube, and this no doubt serves to modify the voice.

In the dredge I obtained a few Molluscs and Crustacea, an apparently undescribed Amphipod of the genus *Iphimedia* among the latter. We left Elizabeth Island early next morning, leaving behind us two officers, with their boats' crews (who, it had been settled, were to remain in the Strait engaged in surveying work, during a trip to the Falkland Islands, which we were necessitated shortly to make for the purpose of procuring supplies of coal and provisions), and reached the Chilian settlement of Sandy Point before breakfast, finding, to our great satisfaction, that letters from England were awaiting us, which had been left a month before by an American ship, the "Pensacola," on her way through the Strait. Early in the forenoon I landed with some of the officers, and had a pleasant walk. The greater number of the plants had passed out of bloom, but a pretty purple-flowered *Gentiana*, which I did not observe on our first visit, was very plentiful on the plains. I also found a white-flowered *Ranunculus*, very similar to *R. aquatilis*, in the water of a small stream, and a large *Carex* in a damp place at the edge of the woods, together with several mosses, and a *Marchantia*, to all appearance not distinct from the *M. polymorpha* so common in damp places in Great Britain. A considerable number of a species of teal were shot by my companions, as well as a single specimen

of a small black and white woodpecker, with a red crest. This species, the *Picus ligniarius*, which does not appear to be common in the Strait, we subsequently met with at Chiloe.

As we had learned from some of the inhabitants of the settlement who had come on board the "Nassau" on our arrival, that a party of the far-famed Patagonians had lately arrived at the settlement for trading purposes, we paid a visit to their camp before returning to the ship in the evening. On approaching their tents, which were placed in a hollow close to the river's bank, we were met by an individual possessed of a small stock of broken English, of which he appeared very proud, and who announced that his name was Pedro, and that he was a little chief. He considered it necessary to shake hands with us all round, and said, "You come to my house and see skin;" and we accordingly accompanied him to his guanaco-skin tent, where were a number of his tribe, who smiled and looked affable, but spoke little. We were then shown some guanaco, puma, and ostrich skins, and asked, "Why you no bring bread, rum, tabac, from ship?"—rum, as we afterwards learned, being an article which, unfortunately for themselves, they value very highly. The whole party on this occasion consisted of about twenty adults and a number of children. The men were in general tall and very strongly made, particularly as regarded their chests and arms, the muscular development of which, strongly favoured by their habits of life, was excessive. The lower limbs, on the other hand, appeared much less muscular, and they walked with an awkward shambling gait, the result, probably, of their spending the greater part of their lives on horseback, never travelling any distance on foot. Their heads were large, and thatched with thick black hair, in general divided in the

middle, and hanging down in long straight locks. The hair of one man only was frizzled into innumerable little curls, which had the effect of making his head appear as of prodigious size. All wore bands of white linen round the upper part of their foreheads. Their faces were very broad across the cheek-bones, and, as a rule, they possessed good features—the men in this respect, however, greatly excelling the women, the nose being in general of a form approaching to aquiline, and the teeth very white and perfect, save that, in most cases, the cusps of the grinders (molars and premolars) had disappeared, the upper surface of all the teeth being ground down to a uniform level. Whether this effect was produced by the nature of their diet or by artificial means, I am unable to state. Some of the children were very pretty, and the skin of all, both old and young, was of a dark-brown tint, due in part to nature, but, I suspect, considerably deepened by the scanty extent of their ablutions. The dress in both sexes was much the same, consisting of an ample robe formed of guanaco-skins, neatly and strongly sewn together, and worn with the hair innermost. This mantle extended from the neck nearly to the ankles, and was in general confined at the waist by a leather belt. Around the shoulders of the men the robe was generally folded without any fastening, being merely held together by one hand; but, in the case of the women, it was fastened together by two large, more or less ornamented, gilt pins. In addition to this general covering they possessed buskins of horse-skin, which covered the feet and ankles like boots, extending about half-way to the knee. In the neighbourhood of the tents their steeds were pastured; and a large pack of ugly dogs, of different sorts and sizes, roamed about, and were very unsociable, keeping up a constant barking at us.

I think I may not unfitly bring this chapter to a close by giving my reader a short account of what is known of the habits and customs of this remarkable people, and I shall begin by citing a few of the descriptions given of them by the earlier voyagers. The first of these is given by Antonio Pigafetta, the historian of Magellan's voyage, and is so curiously quaint in its language, that I quote the greater part, as it may amuse some of those who have not been previously acquainted with it. He narrates that after they had spent about two months at Port St Julian—*

"One day by chance they espyed a man of the stature of a Giant, who came to the Hauen dancing and singing, and shortly after seemed to cast dust ouer his head. The Captaine sent one of his men to the shore with the ship Boat, who made the like sign of peace. The which thing the Giant seeing, was out of feare, and came with the Captaine's seruant to his presence into a little Iland. When hee saw the Captaine with certaine of his companie about him, hee was greatly amazed, and made signes, holding vp his hand to Heauen, signifying thereby that our men came from thence. This Giant was so big, that the head of one of our men of a meane stature came but to his Waste. He was of good corporature, and well made in all parts of his body, with a large Visage, painted with diuers colours, but for the most part yellow. Upon his Cheekes were painted two Harts and Red Circles about his Eyes. The Hayre of his Head was coloured white, and his Apparell was the Skinne of a Beast sewed together. This Beast (as seemed vnto us) had a large head, and great eares like vnto a Mule, with the body of a Cammell, and tayle of a Horse. The feet of the Giant were foulded in the same skin after the manner of shooes. He had in his hand a big and short Bowe, the String whereof was made of a sinew of that Beast. He had also a Bundell of long Arrowes, made of Reedes, feathered after the manner of ours, light, with sharp stones in the stead of Iron heads. The Captaine caused him to eat and drinke, and gave him many things; and, among other, a great Looking-glasse: In the which, as soone as he saw his own likenesse, hee was suddenly

* I take the narrative as given in Purchas *His Pilgrimes*, vol. i., p. 34.

afraid, and started backe with such violence that he ouerthrew two that stood nearest about him. When the Captaine had thus given him certain Hawke's Bells and other great Bells, with a Looking-glasse, a Combe, and a payre of Beads of Glasse, he sent him to land with foure of his owne men well armed.

"Shortly after they saw another Giant, of somewhat greater stature, with his Bowe and Arrowes in his hand. As hee drew neere vnto our men, he layd his hand on his head, and pointed up toward Heaven, and our men did the like. The Captaine sent his ship Boat to bring him to a little Iland, being in the Hauen. This giant was very tractable and pleasant. Hee sung and danced, and in his dancing, left the print of his feet on the ground. Hee remayned long with our men, who named him John. Hee could well speake, and plainly pronounce these words—Jesus, Ave Maria, Johannes, even as wee doe, but with a bigger voyce. The Captaine gave him a shirt of Linnen Cloth, and a Coat of white Woollen Cloth ; also a Cap, a Combe, a Looking-glasse, with diuers such other things, and so sent him to his companie. The day following hee resorted againe to the shippes, and brought with him one of those great Beasts, which hee gaue the Captaine. But after that day they never saw him more, supposing him to be slaine of his owne company, for the conversation he had with our men.

"After other fifteene dayes were past, there came foure other Giants without any Weapons, but had hid their Bowes and Arrowes in certaine Bushes. The Captaine retayned two of these, which were youngest and best made. Hee took them by a deceit : giving them Knyves, Sheeres, Looking-glasses, Bells, Beades of Crystall, and such other Trifles, hee so filled their hands that they could hold no more ; then caused two payre of shackles of Iron to bee put on their legges, making signes that hee would also give them these Chaynes, which they liked very well, because they were made of bright and shining metall. And, whereas they could not carry them, because their hands were full, the other Giants would have carryed them ; but the Captaine would not suffer them. When they felt the shackles fast about their legges, they began to doubt ; but the Captaine did put them in comfort and bade them stand still. In fine, when they saw how they were deceived, they roared like Bulls, and cryed upon their great Deuill Setebos to help them. Being thus taken, they were immediately separate and put in sundry shippes. They could never bind the hands of the other two ; yet was one of them with much difficulty overthrown

by nine of our men, and his hands bound ; but he suddenly loosed himself and fled, as did also the other that came with them. In their flying, they shot off their Arrowes, and slew one of our men. They say, that when any of them die, there appear ten or twelve Deuills, leaping and dancing about the bodie of the dead, and seeme to haue their bodies painted with diuers colours, and that among other there is one seene bigger than the residue, who maketh great mirth and rejoicing. This great Devill they call *Setebos*, and call the less *Cheleule*. One of these Giants which they tooke, declared by signes that hee had seene Devils with two hornes above their heads, with long hayre downe to their feet, and that they cast forth fire at their throats, both before and behind. The Captaine named these people *Patagoni*. The most of them weare the Skinnes of such Beasts whereof I have spoken before, and haue no Houses of continuance ; but make certaine Cottages, which they couer with the said Skinnes, and carry them from place to place They live of raw Flesh and a certaine sweet Root, which they call *Capar* They are very jealous of their Women. When they are sicke at the stomacke, they put an Arrow half a yard or more downe the Throat, which makes them vomit greene choler and bloud. For head-ach, they make a cut ouer the for-head, and let themselves bloud. The like they doe on the arme, or legge, in any Aches. They cut their hayre like Friers, but a little longer, and binde it with a Cotton hayre-lace." " One of these which they had in their shippes, did eat at one meale a Basket of Bisket, and drinke a Bowle of Water at a draught."

In the narrative of Cavendish's voyage, not far from the close of the same century, namely in 1586, it is related that at Port Desire—

" A Man and a Boy, in washing their clothes in a Pit, were hurt by the Savages arrowes, which are made of Canes, headed with flints. They are very wilde. We took the measure of one of their feete, and it was eighteene inches long. Their vse is when any of them die, to bring him or them to the Cliffes by the Sea-side, and upon the top of them they burie them, and in their graves are buried with them their Bowes and Arrowes, and all their Jewels which they have in their lifetime, which are fine shells which they find by the Sea side, which they cut and square after an artificiall maner ; and all is laid vnder their heads. The grave is made all with great stones of great length and bignesse, being set all along full of the dead man's Darts, which he vsed when

he was liuing. And they colour both their Darts and their Graves with a red colour which they vse in colouring themselves."

In Schouten's Voyage, about thirty years later, it is mentioned that at Port Desire, upon the highest part of the hills, they

"Found some burying places, which were heapes of stones, and we not knowing what that meant, pulled the stones off from one of them, and vnder them found men's bones of tenne and eleven feet long: they buried the dead vpon the top of the hils, flat on the ground, and cover them also with stones, which keeps them from being devoured by beasts or birds."

Wood relates that, on his visit to Port St. Julian in 1670, in walking inland, he

"Met seven Savages who came running down the Hill to us, making several Signs for us to go back again with much Roaring and Noise, yet did not offer to draw their Arrows: But one of them who was an old Man, came nearer to us than the rest, and made also Signs we should depart, to whom I threw a Knife, a Bottle of Brandy, and a Neckcloth to pacify him; but, seeing him persist in the same Signs as before, and that the Savageness of the People seemed to be incorrigible, we returned on Board again."

He then adds—

"As far as I could observe by these People, they have no Houses nor Habitation, but wander from Place to Place to seek their Food, which consists mostly in Seals and Limpids, with some Fowls and Deer. Having spent the Day in the said Manner, they return at Night, and put themselves behind some Bush, where they may make a small Fire, I suppose on purpose, because they should not be discovered afar off by Night; and they lie upon the cold Earth, without any other Canopy but Heaven. As for the Apparel of these Savages, they have no other but Mantles made of Deer-Skins sewed together, wherein they wrap themselves up, and need no other Covering, they being by Nature very hardy, and of an Olive Complexion, as all the *Americans* are, in Conformity to most of whom, these also paint their Faces and Bodies with many Colours. It happen'd that some of our Men being on Shoar, *August* the 16th, on the East-Side, in order to fill Water, two of them at a

small Distance from thence met with two *Patagonians* behind a Bush, who immediately ran away from them, leaving their Baggage behind them, consisting of some Skins sewed together, made into little Bags ; wherein were contained some Flints and Colours, besides two Dogs thay had there also tied together."

It is, however, to the observations of Falkner, a Jesuit missionary in South America during a part of last century, and to the narratives of King and Fitzroy in more recent times, that we are chiefly indebted for authentic information regarding the Patagonians. At the present time, in so far as we were able to ascertain from our repeated interviews with them in the Strait, many of them are, as respects their religion, Roman Catholics, at all events in name ; but this altered or perhaps additional creed appears to be of considerably recent date, as Falkner tells us, in his account of their superstitions, that they

" Believe in two superior beings — the one good, the other evil. The good power is called by the Moluches, Toquichar, which signifies governor of the people ; by the Taluhets and Diuihets, Soychu, which in their tongue signifies the being who presides in the land of strong drink ; the Tehuelhets call him Guayana-cunnee, or the lord of the dead."

He farther states that

" Their worship is entirely directed to the evil being, except in some particular ceremonies made use of in reverence to the dead. To perform their worship, they assemble together in the tent of the wizard ; who is shut up from the sight of the rest in a corner of the tent. In this apartment he has a small drum, one or two round calabashes with small sea-shells in them, and some square bags of painted hide, in which he keeps his spells. He begins the ceremony by making a strange noise with his drum and rattle-bone, after which he feigns a fit or struggle with the devil, who it is then supposed has entered into him ; keeps his eyes lifted up, distorts the features of his face, foams at the mouth, screws up his joints, and after many violent and distorting motions, remains stiff and motionless, resembling a man seized with an

epilepsy. After some time he comes to himself, as having got the better of the demon ; next feigns, within his tabernacle, a faint, shrill, mournful voice, as of the evil spirit, who, by this dismal cry, is supposed to acknowledge himself subdued ; and then, from a kind of tripod, answers all questions that are put to him. Whether his answers be true or false, is of no great signification ; because, if his intelligence should prove false, it is the fault of the devil. On all these occasions the wizard is well paid."

We are, however, informed that, although the profession is honourable and lucrative, it is not without its drawbacks, as in the case of any misfortune occurring to the tribe, such as the death of a chief, or the ravages caused by pestilence, the wizards are often put to death. Elsewhere, he states, that the Patagonians say that

"The stars are old Indians, that the Milky Way is the field where the old Indians hunt ostriches, and that the two southern clouds are the feathers of the ostriches which they kill."

How far the foregoing account of the religious rites of these people is correct we have no means of knowing. Captain King, in his narrative, gives a curious account of a ceremony, apparently founded on Roman Catholicism, of which he was an eye-witness. He states that having shown himself inquisitive about the contents of a red baize bundle in the possession of Maria, a woman who was cacique of her tribe, she said to him, "Quiere mirare mi Cristo?" (do you wish to see my Christ?), and that the following proceedings then took place :—

"Maria, who, by the lead she took in the proceedings, appeared to be high priestess as well as cacique of the tribe, began by pulverising some whitish earth in the hollow of her hand ; and then taking a mouthful of water, spit from time to time upon it, until she had formed a sort of pigment, which she distributed to the rest, reserving only sufficient to mark her face, eyelids, arms, and hair, with the figure of the cross. The manner in which this was done was peculiar. After

rubbing the paint in her left hand smooth with the palm of the right, she scored marks across the paint, and again others at right angles, leaving the impression of as many crosses, which she stamped upon different parts of her body ; rubbing the paint, and making the crosses afresh after every stamp was made.

" The men, after having marked themselves in a similar manner to do which some stripped to the waist, and covered all their body with impressions), proceeded to do the same to the boys, who were not permitted to perform this part of the ceremony themselves. Manuel, Maria's husband, who seemed to be her chief assistant on the occasion, then took from the folds of the sacred wrapper an awl, and with it pierced either the arms or ears of the whole party, each of whom, presented in turn, pinched up between the finger and thumb, that portion of flesh which was to be perforated. The object evidently was to lose blood, and those from whom the blood flowed freely showed marks of satisfaction, while some, whose wounds bled but little, underwent the operation a second time.

" When Manuel had finished, he gave the awl to Maria, who pierced his arm ; and then, with great solemnity and care, muttering and talking to herself in Spanish (not two words of which I could catch, although I knelt down close to her and listened with the greatest attention), she removed two or three wrappers, and exposed to our view a small figure, carved in wood, representing a dead person stretched out. After exposing the image, to which all paid the greatest attention, and contemplating it for some moments in silence, Maria began to descant upon the virtues of her Christ, telling us it had a good heart (' buon corazon ') and was very fond of tobacco. Shortly after this the image was carefully packed up again, and the traffic, which had been suspended, recommenced with redoubled activity."

Of another class of ceremonies—namely, those relating to the burial of the dead—Falkner thus writes :—

" When an Indian dies, one of the most distinguished women among them is immediately chosen to make a skeleton of the body, which is done by cutting out the entrails, which they burn to ashes, dissecting the flesh from the bones as clean as possible, and then burying them underground till the remaining flesh is entirely rotted off, or till they are removed (which must be within a year after the interment, but is

sometimes within two months) to the proper burial-place of their ancestors.

"This custom is strictly observed by the Moluches, Taluhets, and Diuihets; but the Chechehets, and Tehuelhets or Patagonians, place the bones on high, upon leaves or twigs woven together, to dry and whiten with the sun and rain.

"During the time that the ceremony of making the skeletons lasts, the Indians, covered with long mantles of skins, and their faces blackened with soot, walk round the tent with long poles or lances in their hands, singing in a mournful tone of voice, and striking the ground to frighten away the Valichus or Evil Beings. Some go to visit and console the widow or widows and other relatives of the dead—that is, if there is anything to be got, for nothing is done but with a view of interest. During this visit of condolence, they cry, howl, and sing in the most dismal manner, straining out tears, and pricking their arms and thighs with sharp thorns to make them bleed. For this show of grief they are paid with glass beads, brass cascabels, and such like baubles, which are in high estimation among them. The horses of the dead are also immediately killed, that he may have wherewithal to ride upon in the Altrue Mapu, or Country of the Dead, reserving only a few to grace the last funeral pomp, and to carry the relics to their proper sepulchres."

The same author also mentions that the Moluches, Taluhets, and Diuihets, bury their dead in large square pits about a fathom deep; but that the Tehuelhets, or more southern Patagonians, having dried the bones of their dead, carry them to a great distance from their habitations, and after placing them in order, and adorning them with robes, beads, weapons, and other property of the deceased, deposit them above ground, under a hut or tent, with the skeletons of their dead horses placed around them.

King thus describes a Patagonian tomb at Gregory Bay, which he visited with the father of the deceased:—

"It was a conical pile of dried twigs, and branches of bushes about two feet high, and twenty-five in circumference at the base, the whole bound round with thongs of hide, and the top covered with a piece of

red cloth, ornamented with brass studs, and surmounted by two poles bearing red flags and a string of bells, which, waved by the wind, kept up a continual tinkling. A ditch about two feet wide and one foot deep, was dug round the tomb, except at the entrance, which had been filled up with bushes. In front of this entrance stood the stuffed skins of two horses, recently killed, each placed upon four poles for legs. The horses' heads were ornamented with brass studs, similar to those on the top of the tomb; and on the outer margin of the ditch were six poles, each carrying two flags, one over the other."

As I have already stated, the Patagonians seen by us on our first meeting with them were generally of a large stature, and such was the case with those we encountered on several occasions subsequently, the men being rarely less than five feet eleven inches in height, and often exceeding six feet by a few inches. Their height, however, appears much greater by reason of their long flowing robes, the comparatively small size of their horses, and the clearness of the atmosphere of the country, which causes comparatively small objects seen at a distance to appear much larger than they really are. It is probably to these circumstances, combined with a love of the marvellous, that we owe the accounts given by the older navigators of the gigantic stature of these people. Their weapons at the present time—for they appear to have discarded the use of bows and arrows—are limited to chuzos or long spears, hunting-knives, and the bolas. The last consist of three rounded stones covered with leather, or of three brass or iron balls, one of which is attached to each end of a plaited leather thong, from six to eight feet long, while the third is fastened equidistant from the other two. When in use this third ball is held in the hand, while the other two are made to revolve rapidly in the air above the head, the missile being then discharged with great force, and generally with unerring dexterity, at the object desired to be taken.

Occasionally the bolas are constructed of but two balls, the intermediate one being omitted; and this kind is principally employed for the capture of the ostrich, the other being reserved for the guanaco.

The guanaco and ostrich, both of which exist in numbers on the plains, form the principal food of the Patagonians, and rows of strips of the flesh of these animals may often be seen hanging up to dry in front of their tents. Their only vegetable aliment, in so far as we could observe, was the long tap-shaped root of an umbelliferous plant, which was either the Balsam-bog (*Bolax glebaria*), or an allied species of *Azorella*. Fitzroy, however, speaks of a second root of a bulbous nature, which they sometimes use along with their meat, and which, according to him, they call "tus."

Except when excited to revenge a real or imaginary injury, or under the influence of alcohol, which is sometimes the cause of frays among them, the Patagonians appear to be an amiable and well-disposed people, and we were always on excellent terms with them. In addition to their own language, nearly all appear to be well acquainted with Spanish, and a few have a little knowledge of English. As to their numbers, it is impossible to speak with certainty, but there can be no doubt that they are rapidly decreasing, owing principally to the influence of strong drink and introduced diseases, such as small-pox, which has destroyed many of them, and in all probability, ere many centuries have elapsed, the race will have entirely disappeared.

There is one point connected with the history of the Patagonians on which I may remark, in conclusion, that I did not succeed in obtaining any definite information throughout the time of our sojourn in the Strait—namely, whether at the present time these people ever hold intercourse with the

Fuegians. King mentions having seen a Fuegian in company with one of the bands of Patagonians whom he encountered, and Fitzroy states, apparently on the authority of Mr. Low, captain of a sealer, whom he encountered in these regions, "that there is every reason to conclude that the Canoe-men of the south side of these waters have frequent and even amicable intercourse with the horse-men of Patagonia. A part of that amicable intercourse consists in selling their children to Patagonians as slaves." That these nations may have frequently met in former times when the islands of Santa Magdalena, Santa Marta, and above all Elizabeth Island,* were tenanted by Fuegians, appears not at all unlikely; but that they have done so for a long time back there is some reason to doubt, as, though we landed on many parts of the coast of N.E. Fuegia, we could never discover the slightest vestiges of canoes or rafts of any description, and in fact, in this part of Fuegia, with the exception of drift wood, no material exists for their manufacture. To the westward, where the Fuegians possess canoes, and are to be met with on both sides of the Strait, the Patagonians do not occur, as they inhabit exclusively the open plains, and do not enter the wooded country, except occasionally for the purpose of trading with the inhabitants of the Chilian colony.

* The Fuegians seem to have disappeared from the first two islands at a very early period, having been exterminated by the men of Oliver van Noort's expedition, but Wood encountered them on Elizabeth Island as late as 1670.

CHAPTER V.

EXCURSION TO SEAM OF COAL IN NEIGHBOURHOOD OF SANDY POINT—OXYURUS — PECKETT HARBOUR — COMMON DUCK OF STRAIT — MEET A PARTY OF PATAGONIANS, AND TRADE WITH THEM—LEAVE THE STRAIT FOR THE FALKLAND ISLANDS—JASON CAYS—REACH STANLEY HARBOUR—CLIMATE AND PRODUCTIONS OF THE FALKLAND ISLANDS—STREAMS OF STONES—DIDDLE-DEE BERRY—BALSAM-BOG PLANT — FALKLAND ISLAND TEA-PLANT — ALMOND-FLOWER — LESSONIA — TAMENESS OF SEA-BIRDS — FALKLAND ISLAND SORREL — MARINE ANIMALS — LEAVE THE FALKLAND ISLANDS FOR THE STRAIT—GRIMOTHEA—REACH THE STRAIT, AND PILOT H.M.S. "ZEALOUS" WESTWARD — TÆNIOPTERA— PORT FAMINE; ESTABLISHMENT OF A COLONY THERE BY SARMIENTO, AND FATE OF THE COLONISTS—FIRST MEETING WITH WESTERN FUEGIAN OR CANOE INDIANS—FISH—PORT GALLANT—FUCHSIAS—SCENERY —PHILESIA — LIBOCEDRUS — FERNS — KINGFISHER — HUMBLE-BEE—PLAYA PARDA COVE—DESFONTAINEA—PART WITH H.M.S. "ZEALOUS," AND RETURN TO SANDY POINT—ANIMALS OBSERVED ON THE ROUTE—PECKETT HARBOUR—THINOCORUS AND ATTAGIS — CHLOEPHAGA POLIOCEPHALA — OAZY HARBOUR — HIPPURIS — BOTRYCHIUM—BUTEO ERYTHRONOTUS.

NOTHING of a noteworthy description occurs in my journal for the 8th and 9th of February, as I remained on board on both of these days, being busily occupied in skinning birds. A fire took place in the forest behind the settlement at this time, causing some anxiety to the colonists; but in the course of two or three days it expended itself, without doing any damage farther than destroying a considerable amount of timber. On the evening of the 10th there was a very remarkable sunset effect; the gravelly beach at one side

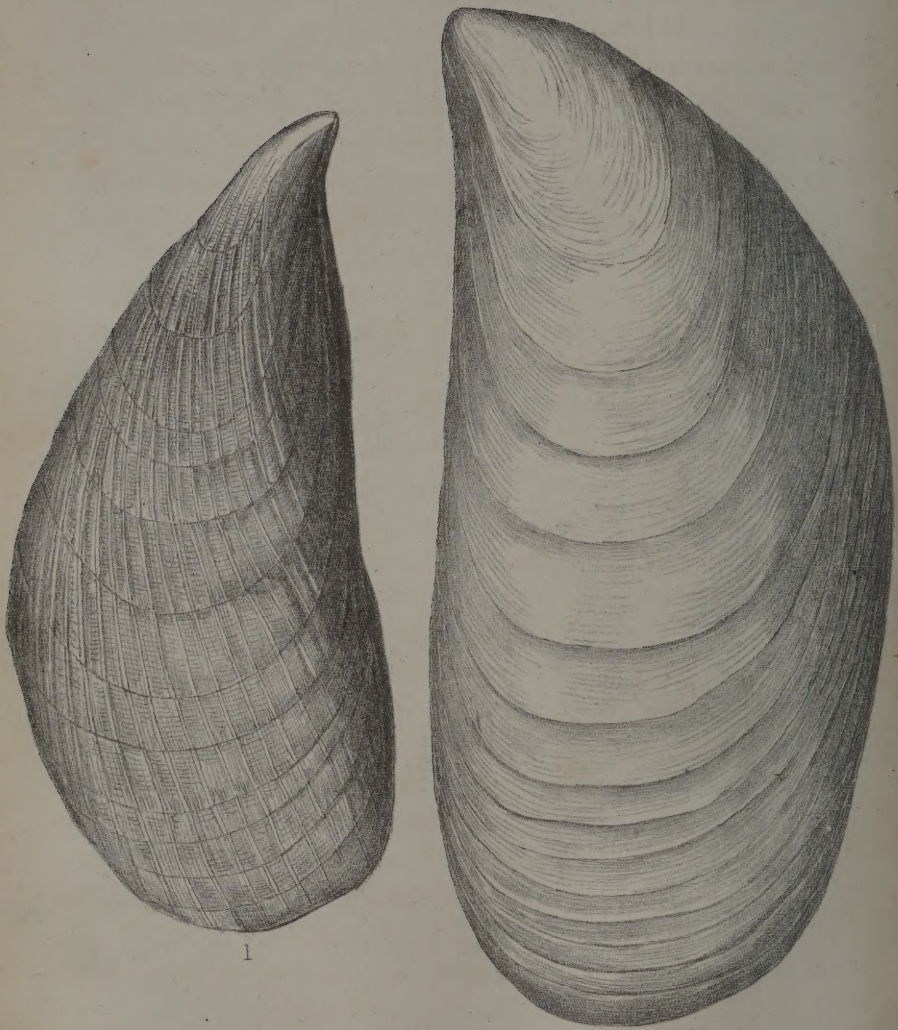
of the settlement assuming a grass-green tint, while the water beyond it was tinged with a bright rosy hue. On the 11th I made an excursion with Captain Mayne and one of the officers to visit a seam of coal in the neighbourhood, which the governor of the colony was anxious that we should examine. We landed in the forenoon, and after some delay in procuring horses, set forth in company with the governor, and a convict who acted as guide. The greater portion of our route lay through the woods, following the course of a small river, which, as I have previously mentioned, flows through a gorge in the hills behind Sandy Point, and enters the sea not far from the settlement, and involved rather rough riding, as our steeds were compelled to jump over many tree-trunks, and to scramble up and down the steep banks of the stream, which required to be crossed many times. Soon after entering the forest, we passed through a broad belt of charred trees, the result of the late fire ; and after we had penetrated for some distance, we observed a perceptible increase in the numbers of the Winter's-Bark trees, the glossy leaves and white flowers of which showed to great advantage. The banks of the ravine through which the stream flows, after a time became very steep and elevated in their character, occasionally presenting fine geological sections, and several thick beds of fossil shells, principally composed of a species of *Ostrea*, being laid bare at one spot. At length, after we had ridden to a distance of between three and four miles from the settlement, we reached the site of the seam of coal, which we estimated to be about 400 feet above the level of the sea. The coal appeared to me, on examining it, to be of tertiary age and of inferior quality ; and I could not but feel very doubtful whether the working of it would pay. On the bank under the trees, not far from where it occurred, I found a few beautiful specimens of

a *Calceolaria*, closely resembling the *C. nana*, but with more and larger leaves and more finely coloured flowers ; and on our ride back to the colony I gathered specimens of a species of currant (*Ribes Magellanicum*), with ripe fruit of a dull reddish colour and insipid taste. On our return on board, Dr. Campbell gave me specimens of two birds which he had shot. One of these was a fine hawk (*Accipiter Chilensis*), and the other, a curious little bird of the creeper family, the *Oxyurus spinicauda* with which we afterwards became very familiar, as it occurred plentifully throughout the wooded country of the Strait of Magellan and Channels on the west coast of Patagonia, in the Chonos Archipelago, and at Chiloe, as well as in many parts of Chili proper. The shafts of the centre tail-feathers are prolonged, woodpecker-like, though it does not appear to climb the trees in the manner of these birds, being generally to be seen hopping about fallen trunks or low shrubs, in search of insects. It is a bold little bird, and often, in the course of our rambles, we were accompanied by about half-a-dozen at a time, uttering their peculiar sharp note at intervals.

Next morning (12th) we left Sandy Point, and proceeded northwards along the Patagonian coast, on the look-out for the party we had left about a week previously at Elizabeth Island, as we were anxious to ascertain their welfare before leaving for the Falkland Islands. Finding them encamped on one of the small islands in Peckett Harbour to the north of Elizabeth Island, we remained at that port for the rest of the day, which allowed some of us to land for a ramble. I found a fleshy-leaved Chenopodiaceous plant, new to me, but little else of interest ; and a considerable number of geese and ducks were shot by the officers. The former were the *Chloephaga Magellanica*, which I have already noticed as common

in this region, while the latter were of two very distinct species, *i.e.* the steamer-duck and the *Anas cristata*, which, with perhaps the exception of the steamer, is by far the most abundant of the Anatidæ of the Strait, being to be met with almost everywhere in greater or less numbers, generally swimming among the broad belts of kelp at some distance from the shore. The plumage of both male and female is compounded of various shades of gray and brown, the latter colour predominating; and the male is distinguished by the possession of a small crest. We found them rather good eating during some months of the year; but at others they had an unpleasantly fishy flavour. The flesh of the steamer is very dark coloured and very strong tasted, so that, after several experiments in cooking it, we agreed in banishing it from our mess-table.

On the morning of the 13th a few Ophiurids of the genus *Ophiomastix*, some small Echini and Annelids, were taken in the dredge. We left Peckett Harbour early in the day, and passed through the second Narrows, anchoring in St. Jago Bay. A very large albatross was observed swimming about at some distance from the ship in the course of the afternoon; and when we arrived at our anchorage, about four P.M., we noticed a large party of Patagonians riding about the country opposite us. On the following day we remained at anchor, a thick mist prevailing, and the obscurity of the atmosphere being materially increased by the smoke of large fires kindled by the Patagonians on the adjoining coast. Early in the day a party of these people were observed making signals to the effect that they wished to communicate with us, and accordingly two of the officers landed to have an interview with them. On their return, a few hours later, they brought with them a supply of guanaco and ostrich



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1. Mytilus Magellanicus

2. _____ Chilensis

meat, which the Indians had exchanged for sugar, tobacco, etc.; and that day we had a characteristically Patagonian dinner, consisting of guanaco-steaks, roast leg of ostrich, and mussels. The ostrich, which we then tasted for the first time, was highly approved of by all of us (the flesh somewhat resembling roast mutton in flavour and colour), and the mussels were very popular with some of the party. Two species of the genus *Mytilus*, I may here remark, are abundant in the Strait—one with a shell possessed of a smooth surface (*Mytilus Chilensis*), which is also common on the coast of Chili; and the other, in which the shell is marked with longitudinal ribs (*M. Magellanicus*). Small pearls are not unfrequently to be met with in both—a circumstance noted by Sir Richard Hawkins, who observes, in the course of his narrative of his passage through the Strait towards the close of the sixteenth century—"Otherwhiles we entertained ourselves in gathering Pearles out of Muscles, whereof there are abundance in all places, from Cape *Froward* to the end of the Straits. The Pearles are but of a bad colour, and small, but it may be that in the great Muscles in deeper water, the Pearles are bigger, and of greater value: of the small seed Pearle, there was great quantitie, and the Muscles were a great refreshing unto us; for they were exceeding good, and in great plenty." Most of the Patagonians encountered on this occasion were tall in stature, one measuring six feet two, and few of them being less than five feet eleven inches. At night their fires cast up a brilliant red glare against the sky.

The 15th was a miserable day, blowing hard, with torrents of rain, so that we were prevented from making a move; and the only event that occurred was the appearance of a Bolivian steamer, commanded by an English captain,

which passed not far from us on her westerly way through the Strait. Next morning, the weather having improved considerably, we left our anchorage, and, passing through the first Narrows, proceeded slowly out of the Strait, taking a line of soundings as we went, and emerging at the eastern entrance late in the afternoon. The 17th was bright and sunny, but there was a heavy swell, and unfortunately but little wind, so that we made rather slow progress. The following day was also fine, and we were favoured with a fair wind. In the evening we reached the Jason Islands, on the north-east of the West Falkland. On passing near Jason West Cay, the westernmost of the group, at about nine P.M., a most pungent odour, compounded of guano and decaying fish, was wafted off to the ship, an unmistakable evidence of an extensive roosting-place of penguins or cormorants ; and, at the same time, we encountered a remarkable tide-rip. A little more than an hour later we were drifted by a very strong current unpleasantly close to Jason East Cay, and soon after one of the steep cones of Steeple Jason, upwards of 1000 feet in height, formed a very striking object, looming through the haze. The morning of the 19th was very misty ; but about nine o'clock the remarkable Eddystone Rock, about 280 feet in height, off Cape Dolphin, on the north coast of the East Falkland Island, was sighted, and revealed to us our position. Between five and six P.M. we entered Port-William, and about an hour later we were lying at anchor in Stanley Harbour, which we all concurred in regarding as one of the most wretched-looking places which we had ever seen—the settlement, on this cold, rainy afternoon, appearing very dreary, with its gray stone houses scattered along the side of a bare, low, bleak hill. We had before long, however, the great satisfaction of finding that a large batch of letters, left by

H.M.S. "Narcissus" a short time before, was lying for us, and over the perusal of these we passed a pleasant evening.

Next morning the weather was fine, and things had assumed a more cheerful aspect, though the colouring of the landscape was very cold—masses of gray quartz-rock cropping out at intervals on the surface of a rugged country, entirely destitute of trees, and covered with a peaty soil, clothed with yellowish wiry grass. It is perhaps hardly necessary to inform the reader that no native trees of any description exist on these islands, and that attempts to introduce them have been hitherto attended with entire failure. Even shrubs are very scarce, and the only plant perhaps that merits the name, the *Veronica decussata*, appears to be confined to the West Island. The greater number of the terrestrial and marine animals* are such as are also to be met with in the Strait of Magellan and adjacent coasts of South America; and the same is the case as regards the plants, but few of which appear to be peculiar to these islands, occurring either on the plains of Eastern Patagonia, or in the western wooded Fuegian region. It is, however, interesting to observe, that though there is an entire absence of trees in this inhospitable spot, several species of plants occur, which in the Strait of Magellan are strictly confined to the wooded country, and are not to be met with on the open plains of Patagonia. This is, doubtless, in great measure, due to the amount of rainfall in these regions, which is much greater than in eastern Patagonia.

On the afternoon of this day a party of three of us landed, and had a pleasant walk over the hill at the back of the

* The Molluscan fauna has been regarded by some authors as considerably dissimilar from that of the Strait, but this is not the case according to my observations.

settlement. From the summit we had a fine view of the curiously-shaped harbour, and saw one of those extraordinary "streams of stones" which have attracted the attention of most visitors to the Falklands, and for the origin of which it is so difficult to account. They are formed of immense accumulations of great angular fragments of quartz, spread out in belts (sometimes as much as a mile broad, and two or three miles long) in the valleys, extending in some instances to the tops of the gray quartz hills, from which they appear to have been derived. The name "streams of stones" is a very fit title for them, as they frequently resemble the course of a great river, although their deposition and arrangement are probably in no way the result of aqueous agency. Mr. Darwin, in his observations on this wonderful phenomenon, remarks that never did any scene like these "streams of stones" so forcibly convey to his "mind the idea of a convulsion, of which in historical records we might seek in vain for a counterpart; yet that the progress of knowledge will probably some day give a simple explanation of this phenomenon, as it already has of the so-long-thought inexplicable transportal of the erratic boulders which are strewed over the plains of Europe." As yet, however, no satisfactory solution of the problem seems to have been arrived at.

On the hill-side I observed several species of plants already recognised in the Strait, such as the "Diddle-dee" berry of the Falkland Islanders (a species of *Empetrum*, at one time regarded as distinct from the *E. nigrum* of Europe, on account of the red instead of black colour of the berries, to which the Upland geese are very partial); as well as others which were new to me, such as the famous Balsam-bog, *Azorella* (*Bolax*) *glebaria;* the Falkland Island Tea-plant (*Myrtus nummularia*); and the Almond-flower of the colonists

(*Callixene marginata*). The first of these plants has for a long period attracted the attention of navigators who have touched at the Falklands, and its appearance is so extraordinary that a casual observer would be most unlikely to refer it to the order (*Umbelliferæ*) to which it truly belongs.* Dr. Hooker remarks that—

"In whatever portion of this country the voyager may land," "he cannot turn his steps inland without seeing scattered over the ground huge, perfectly hemispherical hillocks of a pale and dirty yellow-green colour, and uniform surface, so hard that one may break the knuckles on them. If the day be warm, a faint aromatic smell is perceived in their neighbourhood, and drops or tears of a viscid white gum flow from various parts of these vegetable hillocks. They stand apart from one another, varying from two to four feet in height, and though often hemispherical, are at times much broader than high, and even eight to ten feet long. The very old ones begin to decay near the ground, where a crumbling away commences all round, and having but a narrow attachment, they resemble immense balls or spheres laid upon the earth. Upon close examination, each mass is found to be herbaceous throughout, the outer coat formed of innumerable little shoots rising to the same height, covered with imbricating leaves, and so densely packed that it is even difficult to cut out a portion with a knife, while the surface is of such uniformity that lichens sometimes spread over it, and other plants vegetate on its surface in the occasional holes or decayed places. If at a very early period a young plant of the *Bolax* be removed and examined, the origin of these great holes can be traced; for each of them, of whatever size, is the product of a single seed, and the result of many, perhaps hundreds of years' growth. In a young state the plant consists of a very long, slender, perpendicular root, like a whip-lash, that penetrates the soil. At its summit are borne two or three small branching stems, each closely covered for its whole length with shooting leaves. As the individual increases in size, the branches divide more and more, radiating regularly from the resting centre, instead of prolonging rapidly; these send out lateral short shoots from their apices, and in such numbers that the mass is rendered very

* I learned, in the course of conversation with some of the inhabitants of Stanley, that they believed it to be a kind of fungus!

dense ; and by the time the plant has gained the diameter of a foot, it is quite smooth and convex on the surface. The solitary root has evidently become insufficient for the wants of the mass of individuals, which are nourished by fibrous radicles, proceeding from below the leaves, and deriving nutriment from the quantity of vegetable matter which the decayed foliage of the lower part of the stems and older branches affords."

The Falkland Island tea-plant is a little species of myrtle, the stems of which, thickly covered with small rounded glossy leaves, creep over the surface of the ground, and has derived its name from having been frequently used as a substitute for tea by sealers who have visited the Islands. Its flowers are of a pinkish-white tint, and the fruit which succeeds them possesses an agreeable sweetish taste. The Almond-flower, so called from the delicious fragrance of its pretty white blossoms, which are succeeded by dark purple berries, belongs to a genus generally referred to the order *Liliaceæ*. In the Falkland Islands, I, as a rule, found it clustering in crevices of rock; but in the western part of the Strait it principally occurs half-buried in moss at the base of the trees.

Another plant which I noticed on this occasion was a fern, the *Lomaria Boryana*, which, though extremely abundant in the wooded region of the Strait, does not occur in Eastern Patagonia. It is a fact worth noting, as regards this species, that while in the western part of the Strait it invariably develops a short stem, from one to two feet high, in the Falklands it appears to be as invariably destitute of one. In the gardens of the settlement I observed a species of *Veronica decussata*, as well as examples of the famous Tussac-grass, once abundantly distributed around the greater part of the coast of the islands ; but now, for the most part, restricted to various small islets and projecting headlands, where it can

flourish with immunity from the ravages of the wild cattle which have been its principal destroyers. A little bird, of which many specimens were seen by us on this occasion in the neighbourhood of the settlement, was, I believe, the *Chlorospiza melanodera*, one of the *Fringillidæ*, somewhat resembling a yellow-hammer in general appearance, and flying in small flocks.

In the evening H.M.S. "Zealous" arrived, anchoring in Port William just outside the harbour; and we were gratified by receiving a fresh supply of letters and papers.

The 21st was fine, though rather windy. In the afternoon I landed, with two companions, at the opposite side of the harbour from the settlement, and walked round to it, a distance of about seven miles. On the beach I found a few Chitons, Tunicata, and Sponges; and we saw several cormorants and a great number of steamer-ducks, which were very tame, but hard to kill. One was, however, shot, and proved to be in no respect different from the species as it occurs in the Strait of Magellan. A few additional plants were also obtained, a species of *Achyrophorus* among the number. On the 25th I went on shore in the morning, and had a long walk to the eastern end of the harbour, crossing over the neck of the peninsula which separates it from the open sea beyond, and descending into a sandy bay, on the beach of which the surf was breaking with a thundering sound. Here I saw, for the first time, many fragments of the stems of a gigantic sea-weed (*Lessonia fuscescens*) lying strewn about, some of the specimens exceeding three inches in diameter. Dr. Hooker observes of this and an allied species, that they

"Are truly wonderful Algæ, whether seen on the water or on the beach, for they are arborescent, dichotomously-branched trees, with the branches pendulous, and again divided into sprays, from which hang

linear leaves, from one to three feet long. The trunks usually are about five to ten feet long, as thick, as the human thigh, rather contracted at the very base, and again diminishing upwards. The individual plants are attached in groups or solitary, but gregarious like the pine or oak, extending over a very considerable surface, so as to form a miniature forest, which is entirely submerged during high-water or even half-tide, but whose topmost branches project above the surface at the ebb. To sail in a boat over these groves on a calm day, affords the naturalist a delightful recreation ; for he may there witness, in the Antarctic regions, and below the surface of the ocean, as busy a scene as is presented by the coral reefs of the tropics. The leaves of the *Lessonia* are crowded with *Sertulariæ* and *Mollusca*, or encrusted with *Flustræ ;* on the trunks parasitic Algæ abound, together with *Chitons*, *Patellæ*, and other shells ; at the bases and among the tangled roots swarm thousands of Crustacea and Radiata, whilst fish of several species dart among the leaves and branches."

And the same author adds that

"The ignorant observer at once takes the trunks of *Lessonia*," washed up on the beach, "for pieces of drift-wood ;" mentioning, that "on one occasion, no persuasion could prevent the captain of a brig from employing his boat and boat's crew, during two bitterly cold days, in collecting this incombustible weed for fuel."

On the sandy beach at the eastern end of the harbour a variety of Algæ were strewn, together with a few Molluscs, principally characteristic Magellanic forms, but including one small bivalve that I never met with in the Strait. This was the *Cyamium antarcticum* of Philippi, and occurred in numerous small clusters, connected together by a sort of byssus. Numbers of a beautiful little Gymnophthalmatous Acaleph were also lying on the sand. I saw many steamer-ducks, which were most amusingly tame, sitting watching me with an air of grave consideration, until I had approached within a few yards of them, when they would waddle down the beach, or tumble their great heavy bodies into the water, and then steam off to a safe distance, uttering their strange

cries. At one place, ten cormorants and three steamer-ducks were assembled on three small rocks, placed side by side, and would not take their departure till I had thrown a succession of stones at them ; two of the former birds remaining after several of the stones had struck the rock close to them, contenting themselves with merely flapping their wings slightly, and not taking the trouble to move till I had come within a few feet of them. It was most curious to notice the numbers of cormorants which were perched on old coal-hulks, not in the least disturbed by the presence of the inhabitants of ships in their vicinity. Five porpoises were disporting themselves at one point of the harbour, within three or four yards of the shore, entirely regardless of my near neighbourhood, and did not leave their station until I threw a large stone on the back of one of them, when they hurriedly scudded off in different directions. On the ground near the beach, I found a handsome *Senecio* (*S. Falklandicus*) rather plentifully in bloom, as well as one or two specimens of a beautiful *Oxalis* (*O. enneaphylla*), long supposed to be peculiar to the Falkland Islands, but which also occurs in eastern Patagonia. It is very plentiful at the Falklands, but flowers early in the season, so that it was nearly out of flower at the time of this our first visit. The leaves are curiously divided into numerous segments, and the flowers are large (about the size of, or a little larger than, our common bindweed, *Convolvulus arvensis*), and of a beautiful snow-white tint. In common with the other species of the genus, it possesses agreeably acid qualities.

I returned on board early in the afternoon, and soon after a very thick mist came on, and next day we were detained prisoners on board, as it was blowing hard. Rain or wind, or both combined, appear to constitute the normal state of things in these bleak and desolate islands, although fine days

now and then occur. On the afternoon of the 27th, a misty November-like day, Dr. Campbell and I landed, and walked for some distance along the shore of the harbour, assiduously employed in searching the stranded masses of *Macrocystis* for marine animals, of which we found a considerable number among the interlacing roots, including *Paguri*, *Halicarcini*, *Porcellanæ*, a curious Ascidian (*Cynthia verrucosa*), and another animal of the same order, which recalled the remarkable *Chelyosoma* of the Arctic Seas ; several Annelids, and some Echinoderms, including a small yellow *Cucumaria* (*C. crocea*), and a Cidarid, with strong thick spines (*Temnocidaris* ?).* I also picked up an odd relic in the botanical line, —the dried leaf of a banyan, bearing the following inscription :—"Ficus Indica, Banian Tree, India. From the Great Banian Tree in the Botanical Gardens, Calcutta. Dec. 10th, 1865." The 28th and the 1st of March were two cold, disagreeable days ; an easterly wind blowing, rain falling in torrents, and, to add to our discomfort, the process of coaling going on.

On the evening of the 2d we left Stanley Harbour, with but little regret, setting forth under steam on our return voyage to the Strait. The morning of the 3d was fine ; and as we moved quietly along, several brilliant scarlet patches, of limited extent, were observed on the surface of the water by the officer of the forenoon watch. We managed to dip up a portion of one of these by means of a bucket attached to a rope, and found that the brilliant colour was due to the presence of multitudes of small Decapodous Crustacea, somewhat resembling miniature lobsters, which moved rapidly about in a backward direction, by means of repeated flexions and extensions of their tails. They measured about three-quarters of an inch in length, and their general colour was a vivid scarlet ;

* This Cidarid I never met with either in the Strait of Magellan or on the west coast of Patagonia.

the eyes, a central patch on the cephalo-thorax, and a longitudinal line extending along the centre of the tail, being bluish-black. I afterwards ascertained them to be young specimens of the *Grimothea gregaria*, an animal closely allied to *Galathea*, and not unfrequently to be met with in these latitudes. The following year I received specimens which had been taken by the officers of the "Narcissus" at San Carlos in Falkland Sound, and they have been observed in the south of Fuegia both by Dana and Dr. Hooker. They appear also to have attracted the attention of various of the older navigators; Sir Richard Hawkins, among the number, speaking of a cove not far from the Strait of Magellan, where "all the water was full of a small kinde of red Crabbes." The barometer began to fall during the afternoon of this day, and continued falling rapidly during the night, the wind rising at the same time; so that, by the forenoon of the 4th, it was blowing a gale from S.W., and there was a heavy sea on, and we were therefore obliged to keep greatly off our course. By the evening, however, the barometer had again begun to ascend; and early on the morning of the 5th the wind died almost entirely away; and, accordingly, sail was taken in, and we were able to keep right on our way under steam. Very early on the following morning Cape Virgins was made, and after we had anchored for a short time on the Sarmiento Bank to await the approach of daylight, we entered the Strait, and finding the "Zealous," which had left the Falkland Islands a few days before us lying off Cape Possession, we anchored near her, and remained there for the rest of the day, as the weather appeared unpropitious for proceeding farther on. Here we obtained a fine haul of *Waldheimia venosa*, some *Calyptreæ*, dead Volutes, etc.

It having been arranged that the "Nassau" should pilot

the "Zealous" through the Strait, the two ships set out in company at daylight next morning. On passing Elizabeth Island we communicated with one of the two officers who had been left with the surveying party, and learned that they were all well, and had seen much of the Patagonians, who had been very civil to them. We reached Sandy Point between five and six P.M., and there remained during the following day. In the forenoon, Captain Mayne, on his return from taking sights on shore, brought me specimens of gold, associated with quartz, and samples of copper ore, which the governor had given him to examine, stating that they had been procured in the neighbourhood of the settlement. I spent the afternoon on shore, and found several Fungi that were new to me. One of these was a large *Polyporus*, of an exquisite mottled crimson colour, growing on the Antarctic beech; and another was the *Cyttaria Hookeri*, discovered by Dr. Hooker at Cape Horn, and which also occurred on the deciduous beech. A few birds were shot, one of which was a kind of flycatcher (*Tænioptera Pyrope*), with soft grayish plumage, often noticed by us during our later experiences in the Strait. Mr. Darwin has observed concerning it, that it is not uncommon near Port Famine, and along the whole western coast, even as far as the desert valley of Copiapo. I never, however, saw it in the channels or the west coast of Patagonia, although I believe I observed it at Chiloe. As Mr. Darwin accurately remarks, "it generally takes its station on the branch of a tree on the outskirts of the forest. When thus perched, usually at some height above the ground, it sharply looks out for insects passing by, which it takes on the wing."

We weighed on the forenoon of the 9th, and proceeded southwards, noticing with interest the change in the aspect

of the land on either side of us, which by degrees assumed a much bolder and more elevated character, exhibiting many mountain-peaks covered with perpetual snow. The sky also became altered in appearance, being covered with black clouds, which, at intervals, descended in heavy showers, and caused us to realise that we were approaching the confines of the rainy region of the west. At three P.M. we reached Port Famine, situated about thirty miles to the south, and somewhat to the westward of Sandy Point, on the Patagonian coast, and here we came to a halt for the day. The port was thus named by Cavendish in 1587, in commemoration of the sad fate of a colony of Spaniards left there by Sarmiento, between three and four years previously. Sarmiento, having been despatched by the Spanish government to fortify the Strait, in order to prevent the English from passing through it, established two settlements —one at Cape Possession, which he named Nombre de Jesus; and the other at Port Famine, calling it King Philip's City. But, on the "Approach of Winter," in the words of Wood's succinct narrative, he "took five-and-twenty seamen along with him, and departed for Spain;" but in his way thither, being captured by Sir Walter Raleigh and brought prisoner to England, the unfortunate Spaniards were left to starve in the Strait. Their fate appears to have remained unknown until Cavendish visited these parts some years later, when he found only four-and-twenty survivors out of the original four hundred colonists. The following account of their sufferings occurs in the narrative of his voyage :—

"The ninth day wee departed from Penguin Island, and ranne South South West to King *Philip's* Citie, which the Spaniards had built: which Towne or Citie had foure Forts, and every Fort had in

it an cast Peece, which Peeces were buryed in the ground; the Carriages were standing in their places vnburied; wee digged for them, and had them all. They had contrived their Citie very well, and seated it in the best place of the Straits for Wood and Water. They had builded up their Churches by themselves. They had Lawes very severe among themselves, for they had erected a Gibbet, whereon they had done execution vpon some of their companie. It seemed vnto us that their whole living for a great space was altogether upon Muskles and Lympits; for there was not anything else to be had, except some Deere which came out of the Mountaines downe to the fresh Rivers to drinke. These Spaniards which were there, were only come to fortifie the Straits, to the end that no other Nation should have passed through into the South Sea, saving only their owne; but as it appeared it was not Gods will so to have it. For during the time that they were there, which was two yeares at the least, they could never have anything to growe, or in anywise prosper. And on the other side, the Indians oftentimes preyed upon them, vntill their Victuals grew so short (their store being spent which they had brought with them out of *Spaine*, and having no meanes to renew the same), that they died like Dogges in their Houses, and in their Clothes, wherein we found them still at our comming, vntill that in the end the Towne being wonderfully taynted with the smell and the savour of the dead people, the rest which remayned alive were driven to burie such things as they had there in their Towne either for provision or for furniture, and so to forsake the Towne, and to goe along the Sea-side, and seek their Victuals, to preserve them from starving, taking nothing with them, but every man his Harquebuze and his furniture that was able to carry it (for some were not able to carry them for weaknesse), and so lived for the space of a yeere or more, with Rootes, Leaves, and sometimes a Fowle which they might kill with their Peece. To conclude, they were determined to have travelled towards the River of Plate, only three and twentie persons being left alive, whereof two were Women, which were the remainder of foure hundred."

The tragical celebrity of Port Famine was further increased at a much later period by the death of Captain Stokes, who, associated with Captain King in the survey of the Strait at the close of the first quarter of the present century, here put

an end to his life, his mind having given way under the anxiety and hardships which he had experienced in the course of his work. About sixteen years later, the Chilian government, as I have elsewhere incidentally remarked, established a colony here, which was removed after some time to Sandy Point. The anchorage has been for long regarded as an excellent one, and is well known to all those who have had occasion to pass through the Strait.

Immediately after we anchored, a large party of us landed and spent some hours on shore, encountering now and then very heavy showers of rain. We found the woods so thick that it was hardly possible to penetrate into them for any distance ; and accordingly wended our way along a tract of open ground between the forest and the sea, till our further progress was arrested by the Sedger, one of the largest of the rivers flowing into the Strait, and, according to the chart, navigable by boats for a considerable distance after quarter flood-tide. So many of the plants were out of bloom that I did not add materially to my botanical collection, though I obtained some very fine foliaceous lichens on the stems of the trees. Several teal, and a specimen of the gray flycatcher obtained on the previous day at Sandy Point, were shot, and we saw numerous small flocks of a black starling, or Troopial (*Curœus aterrimus*), which we at a later period found to be one of the few land-birds common in the western region of the Strait and western Patagonian Channels, besides occurring abundantly in Chili, where it is frequently kept as a cage-bird on account of the facility with which it may be taught to talk. Ordinarily its notes, when in the wild condition, are sufficiently harsh, but on one occasion I saw one that was singing most melodiously on the top of a low tree. Possibly this may have been an escaped bird, the accom-

plishment having been acquired in a state of captivity. While we were strolling along the northern bank of the river, we had our first sight of the western Fuegian Indians, a party of whom appeared on the opposite side attired in short seal-skin cloaks, which hardly covered their bodies, and left their lanky legs bare. They attempted to hold communication with us by howling in their language, and repeated with astonishing accuracy various slang phrases that were shouted to them in reply by some of the members of our party. Returning to the landing-place along the sandy beach, I found many specimens of a sand-inhabiting bivalve, the *Mactra edulis* of Captain King, who thus named it on account of its having furnished an article of food much appreciated by his ship's company, and a portion of a Crustacean of the genus *Galathea*, the *G. subrugosa*, a species which I often met with subsequently in the Strait, and which also has been taken at the Auckland Islands. Steady rain set in soon after we got on board, and continued during most of the evening. A seining party, which had been despatched soon after we anchored, returned shortly after dark, tolerably successful, having caught many specimens of a species of *Atherinichthys* (the *A. laticlavia*), as well as of a larger fish presenting a general resemblance to a mullet.

We weighed the following morning, and continued our southerly and westerly course. While the anchor was being got up, two canoes of Fuegians came alongside. They brought bows and arrows for barter, and apparently knew no English but "tabac," which they repeatedly demanded. They had fires in the bottom of their boats, and pulled with quick, short strokes, using paddles resembling short oars. It rained heavily during the greater part of the day, with occasional brief intervals of fair weather, which were occupied by me in contem-

plating the magnificently savage character of the scenery of the Patagonian and Fuegian coasts, the mountains on either side towering up steeply from the water's edge, with their summits in many instances thickly mantled with snow. Turning Cape Froward, the southernmost point of the continent of South America, we kept along the Patagonian side of the Strait, passing, after a time, the striking cliffs of Cape Holland, and towards the close of the afternoon reached Fortescue Bay, at the entrance of Port Gallant, where we anchored for the night.

On the following day (11th) it was blowing very hard squalls, with but brief intervals between them, outside our anchorage, and it was therefore considered unadvisable to make a move—a circumstance regretted by few of us, as affording an opportunity for the examination of the country in the neighbourhood. Early in the forenoon, therefore, a large party of us, well encased in waterproofs, left the ship, landing on a small wooded islet (Wigwam Island of the charts) at the entrance of Port Gallant. As we neared the beach, our attention was attracted by the brilliant red colouring presented by a thicket of tall bushes, which we supposed to be *Fuchsias;* and on stepping on shore we ascertained that our conjecture was correct, and were greatly delighted with the beautiful appearance of these elegant shrubs, which attained a height of from eight to twelve feet, and were loaded with blossoms. This *Fuchsia* (the *F. Magellanica*) is widely distributed throughout the western part of the Strait, the Channels, and the west coast of Patagonia, the Chonos Archipelago, Chiloe, and South Chili, and was, until within the last few years, confounded with the *Fuchsia coccinea* of Aiton, a very distinct species as Dr. Hooker has demonstrated. It very generally occurs in thickets, affording a most serviceable

shelter to the wigwams of the Fuegian Indians, and its flowers are eagerly sought after by a little humming-bird which extends as far south as these cold regions. After a short time spent on this island, we crossed from it to the mainland on a gravelly peninsula, uncovered save at high tide. Here I picked up some dead shells of a large species of *Fissurella*, and I also found a *Lichina* growing plentifully on the stones. We then skirted along the edge of the thick woods which encircle Port Gallant, separating in various directions as inclination led us; and, despite the heavy rain which set in after a time, I passed some delightful hours in the pursuit of my avocations. The mountain scenery was of a character ineffaceable from the memory. Standing at the water's edge, and directing one's gaze gradually upwards, there was to be observed, first a series of densely wooded, nearly perpendicular slopes; next an almost infinite succession of gray precipices of gneiss and granite, with a multitude of foaming cascades pouring down their fissures; then vast tracks of spotless snow; and finally black jagged peaks, half concealed by the clouds. Drake certainly did not exaggerate, when, in the course of his account of those regions, he observes—

"The land on both sides is very huge and mountainous; the lower Mountaines whereof, although they may be monstrous and wonderful to look upon for their height, yet there are others which in height exceede them in a strange manner, reaching themselves above their fellowes so high, that betweene them did appear three Regions of Clouds."

I had a very interesting but most laborious walk through the woods, which were soaking wet, as indeed the entire surface of the land in the western part of the Strait, without exaggeration, may be stated to be. Nowhere was there a

level space of ground to be lighted on, but on all sides existed elevations formed by dead stumps and prostrate trunks richly clothed with lichens and Jungermanniæ, interspersed with mossy hollows into which I sank above my waist; while in addition the ground was everywhere intersected by numbers of minute rivulets, often concealed from view by the luxuriant growth of the mosses and ferns which fringed their banks. I had hardly entered the woods when one of the officers brought me a specimen of an exquisite rose-coloured flower, which I found in the course of the two succeeding years everywhere abundant in the damp region of the Strait and the Western Channels, and with whose beauty I never ceased to be delighted. This was the elegant *Philesia buxifolia*, an endogenous plant classed by some botanists with the *Smilaceæ*, by others with the *Liliaceæ*, and by a third party regarded as the type of a natural order named *Philesiaceæ*. It varies very much in its growth, for although in ordinary circumstances it forms a suberect under-shrub from one to two feet in height, when it occurs close to the base of trees its branches frequently elongate, and pushing themselves through the coating of moss and lichens, with which the trunks of the trees in this humid country are, with few exceptions, covered, often attain a height of from six to ten feet or more. The leaves are narrow, alternate, and coriaceous, with thickened margins; and the flower is a bell-shaped perianth, about two inches long, by a little more than one inch in diameter at the mouth, formed of six divisions, the three outer of which are much shorter and narrower than the three inner, each of which is provided at the base with a greenish-yellow glandular pit, which secretes a honey-like fluid. The stamens are six in number, and have the lower portion of their filaments united to a tube, through which the long style, bearing at its

summit a green trilobed viscid stigma, passes. The appearance presented by a cluster of these beautiful flowers hanging pendant from the branch of a tree is most attractive. The plant ranges from Valdivia in South Chili, where it is denominated Pepino, to the south of Fuegia. In the Strait of Magellan I did not meet with it to the east of Port Gallant, nor did I encounter it in the island of Chiloe, though I found it in the Chonos Archipelago. Double flowers occasionally occur. In one of these I found eighteen instead of six divisions of the perianth present, some of which had been formed at the expense of the stamens, which were reduced in number. The fruit of the plant is a rounded hard green berry, containing rugose seeds imbedded in a gelatinous pulp.

The principal trees of which the woods were here composed were the evergreen beech and the Winter's-bark, but some large specimens of a kind of cypress (*Libocedrus tetragonus*) were growing round the water's edge. Their bark was of a bright reddish tint, like that of the Scotch fir, and the foliage, which a good deal resembled that of a *Thuja*, was dark green. Though apparently not very common at Port Gallant, this tree becomes very abundant towards the westward, forming one of the most conspicuous features of the forests in the western part of the Strait and the Channels, and extending at least as far north as Chiloe, where it is termed "Cipres." The "Alerse" of the Chilians, erroneously referred to this tree by King, belongs to a distinct genus, *Fitzroya*, which probably does not occur to the south of the Gulf of Peñas, if so far. The wood of the "Cipres" is employed by the Chilians for building purposes, although I believe they consider it much inferior in value to that of the "Alerse;" and the Fuegian Indians make use of the straight tough stems of the young trees for shafts for their spears.

Among the other plants which were conspicuous on this occasion were the holly-leaved barberry; the *Empetrum rubrum*, forming clumps nearly two feet high, and bearing red and purplish-black berries in nearly equal abundance; and a great fern, the *Lomaria Boryana*, with a thick scaly stem sometimes exceeding two feet in height, bearing at its summit a crown of radiating, stout, leathery, pinnate leaves, sometimes exceeding two feet in length by more than six inches in width. This last, which abounds throughout the damp region of Patagonia and northern Fuegia, often imparts a semi-tropical appearance to the forests on the steep mountain-sides, and it is not surprising that it should have been mistaken for a small species of palm by some of the older navigators.* I also found two beautiful species of *Hymenophyllum*, a pretty little *Asplenium* (*A. Magellanicum*), and a *Gleichenia* (*G. acutifolia*).

Animal life was but poorly represented, the list of Vertebrata being summed up by a few steamer and brown ducks in the water of the harbour, a solitary specimen of a hawk, and a rather large kingfisher, which last was fortunately shot by one of the party. Two species of insects were captured—one a large dragonfly, and the other an orange humble-bee of considerable size (*Bombus Dahlbornii*), which appears to be not uncommon in these parts; and the dredge yielded many dead specimens of *Terebratella Magellanica*, a Pecten (*P. Patagonicus*), and some pretty branching Nullipores.

On the 12th, the weather still continuing unfavourable, we remained at anchor. During the greater part of the day there was a succession of violent squalls, accompanied with showers of sleet, though now and then brief gleams of sun-

* It is well described as "nova especie de palma" in the *Ultimo Viage al Estrecho de Magallanes de la Fregata de S. M. Santa Maria de la Cabeza*, etc. etc.

shine occurred, when rainbow-coloured tints were developed on the land, and a series of fine dissolving views produced—the snowy peaks being lighted up for a moment or two, and then rapidly shrouded in mist. Snow also fell heavily on the higher mountains, descending a considerable distance on their sides. I was busily occupied all day in the examination of the plants procured the previous day, and in skinning the kingfisher. This bird, the *Ceryle stellata*, we found in the course of the two following years common in the dark and dreary inlets of Fuegia and the Channels, as well as at Port Otway, the Chonos Archipelago, and Chiloe. It is often to be seen perched on the branch of a tree overhanging the water, keeping a vigilant look-out for its finny prey, and is of bold nature, readily allowing the sportsman to come within range of it. On more than one occasion a specimen lighted on the lower rigging of the ship, and sat there for some time, uttering at intervals its harsh cry. Above, the principal tint of the plumage is grayish slate-colour, with white spots, while beneath a somewhat rufous hue prevails. I found a curious muscular peculiarity in all the specimens examined by me—two of the longitudinal superficial muscles of the neck (*biventer cervicis*) being connected by a transverse tendon. I was not able to ascertain anything as regards the modification of the species. A female specimen, obtained in December 1868, had ova in a far-advanced state of development in the ovary.

On the 13th, the weather having considerably improved, though there was a westerly wind, we left Fortescue Bay, and continued on our course to the westward. The day, though showery, could not be considered as a bad one for the region; and as we steamed onwards through the narrow reaches which intervene between Port Gallant and the western entrance of the Strait, we had a constant succession of views of the most

F.Le B.Bedwell, del.

Waterston & Son, Edin.

NARROWEST PART OF THE STRAIT OF MAGELLAN.

magnificent description, entirely surpassing my expectations of the mysterious grandeur of this portion of our route, where, as Mr. Darwin has well observed, the distant channels between the mountains appear from their gloominess to lead beyond the confines of this world. At times the nearer wooded heights were bathed in bright sunlight, while the more distant snowy ones were in shadow, and at others the sun shone brightly on the white slopes and peaks, causing the forest-clad hills to appear as a black wall rising sheer out of the water, while occasionally an entire mountain-side was rainbow-tinted. To add to the glorious effect, were several splendid glaciers, some reaching nearly to the surface of the water, and all in a more or less degree exhibiting deep longitudinal and transverse crevasses, the splendid blue colouring of which formed a fine contrast with the dazzling purity of the surface of the icy mass. Passing with a curious gaze the entrance of the remarkable Otway Water, we kept along the coast of the Cordova Peninsula until late in the afternoon, when we anchored in Playa Parda Cove, a beautiful little land-locked nook, surrounded by mountains, and with a cascade pouring down at its head; while the "Zealous," whose large size unfitted her for such a tiny berth, lay a short distance outside the entrance. Here, being otherwise engaged, I did not go on shore, but a few of the officers took advantage of half-an-hour's daylight which yet remained to land for a scramble, and on their return brought me specimens of plants, including a handsome shrub which was new to me. This was the *Desfontainea spinosa*,* a plant with bright green holly-like leaves, and tubular scarlet flowers with short yel-

* The *Flora Antarctica* is my authority for the specific name of this plant, which is perhaps rather *D. Hookeri*. I have not had leisure as yet to examine my specimens with the care necessary to determine the matter.

low lobes. The two following years I found it everywhere abundant, from Playa Parda to the western entrance of the Strait, and from the southern extremity of Smyth's Channel to the Gulf of Peñas. It has also been obtained in Staten Land, and is probably common in the wooded region of the south of Fuegia; while on the chain of the Andes it appears to extend as far north as Peru. Several other species of the genus, regarding the true affinities of which a considerable amount of difference of opinion has prevailed among botanists, have been described—all, I believe, from the western side of South America, and possibly modified forms of a single stock.

The following morning we bid good-bye to the "Zealous," whose ship's company treated us to a parting cheer as she started to pursue her westerly course, in the hope of clearing the Strait before the evening, while we returned on our track to the eastward. Soon after entering English Reach, we saw several Fuegian canoes, and accordingly halted for a few minutes to allow one of them to come alongside. In her were three men, who shouted and screamed, much after the fashion of sea-birds, as they approached us, at the same time waving their sealskin cloaks above their heads. On coming close to the ship they vociferated "Rope, rope, yammerschooner," and then kept up a perpetual yell of "tābācā, tabācā," accompanied with a variety of gesticulations. Though better off in respect of garments than the inhabitants of another canoe previously seen by us, the greater number of whom were entirely naked, they appeared very insufficiently clothed considering the severity of the weather, the snow this day extending half-way down the hills—their sole attire consisting of the above-mentioned cloaks, which only covered their backs and shoulders. They had, however,

a fire of green boughs of the evergreen beech, on a bed of hard clay, in the bottom of the canoe, which was formed of five thick strips of bark fastened together with rushes, one piece forming the floor, and the remaining four the sides. They exchanged a bow, arrows, and a quiver, for some tobacco, and when we had given them some ship-biscuit, we moved on. The first revolution of the screw seemed to amuse them very much, after which they appeared rather terrified, and paddled off in a great hurry. I was struck with the difference of their physiognomies, one man being hideously ugly, while another possessed decidedly good features. Travellers, I suspect, often draw erroneous conclusions as to the type of face which prevails in a tribe or nation, from having only seen a few representatives of it; and the same no doubt holds good with regard to the examination of isolated examples of crania.

We noticed many dark-coloured seals (probably *Arctocephalus Falklandicus*, the fur-seal of commerce, which is not rare in the Strait), leaping out of the water in the distance, the body of the animal being bent during the spring after the manner of a bow. We reached Fortescue Bay early in the afternoon, and on this occasion entered Port Gallant, where we remained during the rest of the day, a number of us landing, as usual, in search of sport and specimens. Many heavy showers of sleet fell, and the surface of the country appeared, if possible, even wetter than on our previous visit. I obtained a few more mosses and lichens by dint of scrambling about in the woods, in which a deathlike silence reigned, only broken occasionally by the note of a little bluish-black bird (*Scytalopus Magellanicus*), resembling a wren in its general appearance and familiar habits. According to Mr. Darwin, to whose careful and minute observations I have so often to

refer, it is widely distributed on the west coast of South America, extending as far north as Central Chili; and "it has found its way over to the Falkland Islands, where, instead of inhabiting forests, it frequents the coarse herbage and low bushes, which in most parts conceal the peaty surface of that island." Several steamer-ducks and teal were shot, and a considerable number of fish of the same species obtained at Port Famine were taken in the seine, together with a single example of a Trachinoid form of most forbidding appearance. This fish, the *Aphritis gobio*, was first described by Dr. Günther, about ten years ago, from a specimen in the British Museum, procured by Captain King at Port Famine. It has a large broad head, and presents a most ferocious aspect when captured, opening its wide mouth, and erecting its fins and an orbital tentacle situated at the back of each eye. It is of a dusky-brown colour above, variegated with orange-yellow on the sides. The under parts are likewise orange-yellow; and on each side, below the lateral line, there is a row of branched cutaneous appendages attached to the under surface of the scales.

We left Port Gallant on the morning of the 15th, pursuing our easterly course, and, as we rounded Cape Froward, met H.M.S. "Reindeer" proceeding in the opposite direction. In the evening we reached Sandy Point, where we found the Chilian war-steamer "Concepcion" lying; and next morning I landed, with several other members of our party, and spent the day on shore. We found the river greatly swollen with recent rains, and the open ground in many places was swampy, and abounded in mushrooms. This cosmopolitan Agaric we afterwards met with in many localities, both in Patagonia and north-eastern Fuegia, and

it occasionally formed an agreeable addition to our rather monotonous diet. Heavy rain set in before long, and continued throughout the day. I obtained specimens both of *Cyttaria Darwinii* and *C. Hookeri* on the boughs of a beech-tree under which I took shelter. The 17th was dull and cloudy in the morning, but the weather gradually improved as the day wore on. Early in the afternoon, one of a lot of pigeons which we had brought from the Falkland Islands for the governor of the settlement, lighted on the lower part of the rigging of the mainmast, and soon after a handsome hawk arrived in pursuit of it, perching on one of the boats slung at the davits in the coolest manner. On the cap of a revolver being snapped at it, however, it flew off, and left its intended prey in safety. This pigeon and another accompanied the ship during most of the remainder of the season, becoming very tame, and being a source of considerable interest to the ship's company. On the 18th I remained on board, occupied in the preservation of specimens; but on the afternoon of the following day I landed, and had a long walk along the beach to the south. It was a very still, gray, hazy day, with occasional drizzling rain, and the landscape presented a singularly lifeless aspect. I saw only one bird that was new to me—a kind of night-heron (*Nycticorax obscurus*), with dusky grayish-brown plumage, which I afterwards observed at the Falkland Islands, and in many localities in the western part of the Strait and Western Channels, as well as at Chiloe. It is of a bold disposition, allowing one to approach within a short distance of it, and then making off with a heavy flapping flight, uttering at the same time a very harsh croak. The skin is exceedingly thin, and rather loosely feathered.

On the 20th we left Sandy Point in the forenoon, and

after communicating with one of the surveying boats in Laredo Bay, proceeded on to Peckett Harbour, and anchored there early in the evening. Next morning I left the ship with Captain Mayne, and visited various parts of the harbour with him, rambling out in search of specimens while he was engaged in taking angles at different points. I found many clumps of Balsam-bog (*Bolax glebaria*), and observed numerous specimens of the large Buff Ball (*Lycoperdon*) noticed on our first visit to Sandy Point. *Empetrum nigrum*, var. *rubrum*, was also very abundant, patches of the ground being rendered scarlet by the profusion of its red berries, which form one of the principal sources of food of the geese and ostriches. In the eastern part of Patagonia the plant seldom exceeds three or four inches in height, but its branches are often prostrate, and then extend along the surface of the ground for a considerable distance. The green plant burns very readily with a bright flame, which renders it useful when camping out. Another berry-bearing plant, plentiful in the same situations as well as on the bare summits of many of the Fuegian hills, belongs to the heath order, and to the genus *Pernettya*. It is the *P. pumila*, and creeps along the ground so as to be almost concealed by the other vegetation. Its flowers are white, and the berries, frequently of the size of the common snow-berry of our gardens, are of a pale pink colour. The 22d was occupied in the same manner. We left the ship early, and landed at numerous places, ascending an inlet at the western side of the harbour, till brought to a halt by the rapid shoaling of the water.* At one place the putrefying carcass of a large seal, probably the Sea-Leopard (*Stenorhynchus*

* From the configuration of the land at this point it appears not unlikely that at one period a communication existed between Peckett Harbour and the Otway Water.

leptonyx), as the remains of the skin were spotted in the manner characteristic of this species, was lying; but unfortunately none of the bones were in a state fit to carry away. Many ducks and geese were seen, but were for the most part very difficult of approach, contrasting in this respect strikingly with the cormorants, which, as if aware of their worthlessness, flew about close to the boat, gazing at us with an expression of stupid wonder. In the course of the day two curious little birds new to us were shot—the *Thinocorus rumicivorus* and *Attagis Falklandica*—the true position of which, in a strictly natural classification of birds, appears to be somewhat doubtful. Of the former bird Mr. Darwin has remarked, that "it nearly equally partakes of the characters, different as they are, of the quail and of the snipe;" and that it "is found in the whole of southern South America, wherever there are sterile plains, or upon open, dry pasture land," adding, that he saw it as far south as the inland plains of Patagonia, at Santa Cruz, in lat. 50°. In the Strait of Magellan it appears to be not uncommon, as we frequently saw small flocks on subsequent occasions. Its habits, in so far as I had an opportunity of observing them, greatly resembled those of a small plover; and I have several times mistaken it for one of these birds. The latter bird, *Attagis*, which considerably exceeds the former in size, was seen by Mr. Darwin, "on the mountains in the extreme southern parts of Tierra del Fuego," where "it frequents, either in pairs or coveys, the zone of alpine plants above the region of forest," but was never observed by us except on the open low-lying country of the eastern portion of the Strait. The plumage is prettily mottled, somewhat like that of a quail. An allied species of the genus (*A. Gayi*) occurs on the mountains of Chili. On the 23d I was occupied on board all day; and on the three

succeeding days it was blowing so hard as to render it impossible to leave the ship. On the forenoon of the 27th, as there was but little wind, we weighed anchor and moved on to Oazy Harbour, some miles to the north-eastward, to join two of the officers who had been despatched thither some days previously. This harbour is land-locked, and its entrance additionally narrowed by a very remarkable long, curved gravel-spit; but it is, I believe, of little value as an anchorage, except for very small ships, owing to its excessive shallowness, save at one very limited spot. On our arrival, early in the afternoon, two officers, who had preceded us, came on board, bringing with them a specimen of the heron mentioned above as seen at Sandy Point, as well as a beautiful species of goose, quite new to us. This bird, the *Chloephaga poliocephala*, is of considerably smaller size than the upland goose (*C. Magellanica*), and its plumage is exceedingly handsome, the wings being finely bronzed, and a broad band of rich chestnut-brown passing across the breast. It appears to be common in the eastern portion of the Strait, where we observed it to be tamer than the upland goose, and we also met with it on several occasions in the Western Channels, where I only once saw a pair of the *C. Magellanica*. Its flesh is very good, and possesses a more delicate flavour than that of the other species.

On the 28th it was blowing too hard to permit of any surveying work being accomplished until late in the afternoon, when the boats were engaged for an hour in taking soundings. The 29th was calm and bright, and four of us landed in the morning, glad to be released from our captivity, and spent the day on shore, walking round a considerable portion of the harbour. On the spit at the entrance I noticed many bones of guanacos lying about among the plants of *Senecio*

candidans, which, in the eastern part of the Strait, as I have previously observed, generally forms a conspicuous fringe above high-water mark. As the tide fell, the water dried out for a long distance, leaving extensive mud-flats, which I traversed in many directions, in the vain hope of finding live specimens of the Magellanic Volute. Large beds of Mytili were uncovered, and many specimens of another bivalve, the *Lutraria* (*Darina*) *solenoides*, were lying scattered about. Immense flocks of *Chloephaga poliocephala* were observed by us, as well as a considerable number of ducks; and a plentiful supply of both birds was obtained, the sportsmen returning heavily laden to the ship in the evening. On a flat space of ground close to the beach I found specimens of an obscure-flowered composite plant, with a very pungent smell, and on some high ground the foliage of the *Oxalis enneaphylla* was abundant, the plant having passed out of flower. In a small stream flowing into the head of the harbour I obtained numerous specimens of a Gasteropod of the genus *Lymnæa*, as well as two additional plants, one of which was a *Caltha* (*C. digitata*), and the other a familiar old friend, *Hippuris vulgaris*, the common mare's-tail of our English ditches. The latter, widely distributed over the northern hemisphere, was found at Port Famine by Captain King, while engaged in his survey of the Strait, and this for some time appears to have been the only recorded habitat for it south of the Equator; but it has since, I believe, been ascertained to occur in Chili. In the Strait I afterwards met with it, both at Port Famine and at Sandy Point.

On the 30th and 31st we had bright clear weather, but it was blowing hard, and very cold; and on the 1st of April heavy snow fell in the morning, and a white, ghostly-looking world was presented to my view on coming out of my cabin,

the land being almost hidden by heavy snow-clouds, with the exception of a steep cliff which stood out hard and black, while a thick white mist brooded over the water, on the surface of which brown masses of "kelp" were indistinctly visible. Before noon, however, the snow ceased, and early in the afternoon, as it was fair and bright, a party of us landed and spent some hours on shore. Parting soon from my companions, who were bent on sport, I at first directed my steps along the beach, afterwards ascending to the high land above it, walking along the top of some steep cliffs outside the harbour, and pausing now and then to admire the serene beauty of the sunlit points of land stretching out into the calm blue water. In the distance north-eastward, the remarkably furrowed Gregory range of hills had a very fine appearance, the base being of a deep purple tint, while the upper part was covered with a dazzling mantle of snow.

As I pursued my way I was not unaccompanied, as two carranchas (*Polyborus tharus*) followed me for some time, circling about in the air above me, and slowly turning their heads, first to one side, and then to another, in an eager look-out for prey. The Magellanic currant (*Ribes Magellanicum*) and the *Lepidophyllum cupressiforme* were growing plentifully at the summit of the cliffs; and I was interested by finding, on a patch of sandy soil, two specimens of a common little British fern, *Botrychium lunaria*. This widely-distributed species was obtained, towards the close of last century, by Banks and Solander in Good Success Bay, in the south of Fuegia, but, I believe, had not been found by any botanist on the coasts of the Strait of Magellan. The following year one of the officers brought me specimens of it from Cape Possession.

As heavy snow-clouds began slowly to accumulate, I

returned to the spit where we landed, to await the arrival of the other members of the party, occupying myself in wading about in the icy-cold water in search of Volutes, but to no purpose. The clouds continued to gather, and before long a most remarkable spectacle ensued, an immense cloud, in the form of a great dull-red veil falling down to the sea, gradually creeping up to the entrance of the harbour, and presently dissolving in a furious shower of sleet; while from another quarter of the heavens the sun shone out bright yellow from beneath a huge black nimbus, and its rays, striking on the snow-cloud, produced a brilliant fragment of a rainbow. This was all very fine, but I was rapidly becoming cold and drenched, and was therefore well pleased when one of the officers, who had been sounding outside the harbour, arrived in his boat, and took me on board. On the return of the others shortly after, I received from one of them a specimen of a most beautiful buzzard (*Buteo erythronotus*), ash-coloured on the upper parts, and snow-white beneath. On the 2d, a bright, calm, exhilarating day, we left Oazy Harbour before breakfast, and continued under way until evening, employed in taking lines of soundings. On skinning the buzzard, I found its crop crammed with large fragments of one of the burrowing rats. It was comparatively free from parasitic Anoplura, but smelt very strong, in consequence of which a fox, which, as I have previously mentioned, we had on board for some months, and which had been let loose for a run, kept sniffing round my cabin, and when I came out for a "spell," would hardly let me alone, jumping up on me, and smelling my clothes. We anchored in Laredo Bay shortly before sunset, which was one of the most magnificent that we had yet seen—fleets of scarlet, purple, and rosy clouds being spread over a clear yellow and pale green sky, con-

trasting finely with the wooded country about Cape Negro, which stood out in dark relief, the trees and bushes forming a serrated edge along the horizon.

On the 3d we remained at our anchorage until the afternoon, when we moved on to Sandy Point, and the following morning the greater number of us landed soon after sunrise and had a ramble over the country to the north of the settlement. Many snipe were shot, as well as one or two specimens of a kind of plover (*Oreophilus nigricollis*), and one of a little gray bird (*Muscisaxicola mentalis*), which we noticed for the first time, flying about the bushes in small flocks, and which appears to possess a wide geographical range, as Mr. Darwin mentions that he procured specimens of it from Bahia Blanca, in northern Patagonia, Tierra del Fuego, Chiloe, and central and northern Chili. The same author observes, what I myself also remarked, that "it frequents open places, so that in the wooded countries it lives entirely on the sea-beaches, or near the summits of mountains where trees do not grow." On this occasion I again observed the characteristic foliage of *Oxalis enneaphylla*. We returned to the ship early in the forenoon, soon after which we left Sandy Point; and the remainder of the day was occupied in the examination of the Walker Shoal, a bank lying between and to the south of Elizabeth and Santa Magdalena Islands.

CHAPTER VI.

EXCURSION TO QUARTERMASTER ISLAND—CORMORANT ROOKERY—BURROWING OWL—GREGORY BAY—DISCOVERY OF PATAGONIAN CRANIUM—EXCURSIONS TO FUEGIAN COAST—LIZARDS—NIGHT ALARM—LITHODES—SEROLIS—MASS OF FRESH WATER NEAR THE COAST OF PHILIP BAY—ACÆNA, ETC.—DISCOVERY OF FUEGIAN CRANIUM—SHORT-EARED OWL—EXCURSION TO ST. JAGO BAY—JOINED BY A PARTY OF PATAGONIANS, AND ACCOMPANY THEM ON A GUANACO-HUNT—FLAMINGOES—PHRYGILUS ALDUNATII—FUNGI IN THE WOODS AT SANDY POINT—ARRIVAL OF H.M.S. "SPITEFUL"—INTERVIEW WITH PATAGONIANS—SMALL OWL—NEW SPECIES OF RAY—QUERQUEDULA CYANOPTERA—VISIT BURNED PATAGONIAN—CAPE NEGRO—ANIMALS CAST UP ON THE BEACH AT SANDY POINT AFTER A GALE.

After a day employed in sounding in the neighbourhood of Elizabeth Island, we crossed over to Cape St. Vincent, on the coast of Fuegia, early on the morning of the 6th of April, and there anchored, soon after which several parties were despatched on surveying work, and I made use of the opportunity presented to accompany one of the officers on a visit to Quartermaster Island, at the entrance of a deep bay, named Gente Grande by one of the old voyagers, on account of the people of large stature whom he observed in the neighbourhood. The morning was calm when we set out, and a clear tract of pale green sky was visible in the direction of our destination; but there was a thick mass of dark cloud overhead, and we encountered a heavy shower before reaching the island, which we did about noon. Quartermaster, which

appears to have been much seldomer visited than Elizabeth, Santa Magdalena, and Santa Marta Islands, probably on account of its lying more out of the track of vessels, resembles the other three in general structure, being of considerable elevation, and presenting bold perpendicular clay cliffs, and steep grassy banks sloping down to the water's edge. On approaching it, we saw numbers of the common brown duck swimming about in the belt of kelp which extended along the coast at a little distance from the shore, as well as many gulls and cormorants, the latter of which were roosting on ledges on the cliffs ; and on landing, we observed several large dark-brown skua gulls (*Lestris antarctica*), and disturbed a couple of carranchas (*Polyborus tharus*) perched on a flat space of ground at the top of a cliff. On arriving at the place where they had been sitting, we found an accumulation of bones of the *Ctenomys Magellanicus*, including several hundred fragments of crania ; and numbers of shells, principally *Fissurellæ*, together with fragments of *Lithodes antarctica* (the relics of former feasts), were lying scattered around. While we were roaming about in search of a suitable place whereon to erect a beacon, I as usual made a collection of all the plants that were to be seen, obtaining numerous specimens of an *Erodium*, which I had not previously met with, one or two species of *Senecio*, *Homoianthus echinulatus*, an *Azorella*, which formed hard clumps like those of the Balsam-bog, a few grasses, and the *Cerastium arvense*, which occurs plentifully throughout the open country of the Strait, and ranges over a considerable portion of both the Old and the New World. Stunted bushes of *Berberis dulcis* and of *Pernettya mucronata* were also common, and a little brown wren (*Troglodytes Magellanicus*) was flitting about these, and diving into their recesses. After the beacon had been erected, we returned

to the neighbourhood of our landing-place, and halted for a short space for luncheon—drizzling rain soon after setting in, which lasted throughout the greater part of the afternoon. Before long we were joined by two officers from another surveying boat, which had been engaged in taking soundings in Lee Bay, and we then proceeded in company to walk round the island. After a time we reached a plateau at the top of some cliffs, and there beheld a most wonderful congregation of cormorants (*Phalacrocorax carunculatus*). On a moderate computation they must have numbered upwards of a thousand, and they presented a most peculiar appearance as they sat nearly erect, in regular ranks. As we ran up to them, it was most amusing to watch the difficulty which they experienced in taking flight, in consequence of being so closely packed together. Line after line hustled forwards for some paces, and then breaking up, flew over the cliffs into the sea below, where they swam out to a prudent distance. One or two, which had been hit with stones, lay on their backs on the beach for some minutes, emitting strange sounds, and waving about their splay feet in the air, in the most ridiculous manner, till they were sufficiently recovered to take to the water. The space of ground on which they had been assembled was worn perfectly bare of grass for several hundred yards, and the smell of decaying fish, the viscera of which were lying about in innumerable little heaps, was insupportable.

Immediately beyond this roosting-place the high ground sloped steeply down to a long low grass-covered spit, which exhibited at one edge an extensive stratum of cormorants' bones, and upon this tract of ground I found a few additional plants, including a *Geranium* and a species of *Thlaspi*, which latter was extremely plentiful. In the long grass we stumbled

across one or two half-fledged examples of the skua gull, which hobbled about like decrepit old hens. Two specimens of a small rodent were also caught by the men, as well as several examples of a beetle (*Sericoides Reichei*), presenting a considerable resemblance to a cockchafer. As we were approaching the boats we heard a gun fired, and shortly after saw the ship standing out from her anchorage, so we embarked as speedily as possible, and got on board about six P.M. On our return I found that one of the officers who had been on shore at Cape St. Vincent had shot two specimens of the burrowing owl (*Pholeoptynx cunicularia*), which we had previously seen at Maldonado. Mr. Darwin remarks that he never saw it to the south of the Rio Negro, but we ascertained it to be common in the open country of both eastern Fuegia and Patagonia. It appears to be distributed over nearly the entire extent of both Americas, in North America associating with the "prairie dogs" (*Arctomys ludovicianus*). In the Strait of Magellan it evidently adopts a mixed diet, as we frequently saw it feeding on marine animals on the sea-beach. The merry-thought (*furcula*), as in some of the other *Strigidæ*, is not completely ossified.

We remained at anchor in Lee Bay during the night of the 6th, but next morning it came on to blow, which rendered our position unsafe, and accordingly we weighed, and moving over to Royal Road, between Elizabeth Island and the mainland, anchored there for the remainder of the day. The 8th was a remarkably fine day, so that we left Royal Road in the morning ; we passed through the second Narrows, and anchored in Gregory Bay. In the afternoon a party of us, as usual, went on shore for a ramble, and I had a delightful walk over the high ground above the beach in the direction of the Narrows. The country was of a tumbled character, abounding in little

conical hills, and the bright sunshine gilding their slopes had a very pleasing effect. I found a single late specimen of *Calceolaria nana* in flower, and on the seaward edge of a patch of brackish water, where a number of upland geese were feeding, occurred a curious belt of *Senecio candidans*. While crossing a little sandy valley where many guanacos' bones were lying, I noticed protruding from a sandbank the orbit and part of the frontal bone of a skull, and on proceeding to disinter it, was much pleased to find it to be a fine cranium of a Patagonian, which has been thus described by Professor Huxley, to whom it was sent :—

"This skull (which is that of an adult male) shows very distinct evidence of artificial distortion. Not only is the occiput much flattened and unsymmetrical, but the very retreating forehead has such a surface as appears to me could only have been produced by the application of a frontal compress or bandage. Under these circumstances the cephalic index (·81) is of doubtful value as an indication of the primitive form of the cranium. The supra-orbital ridges are very strongly marked, their real prominence being much exaggerated by the retreat of the forehead. There are no distinct paroccipital processes. The crowns of the teeth are ground quite flat."

Between the undulating country in the vicinity of the Narrows and the Gregory Range extends a flat plain, covered with the usual yellowish grass, and dotted at distant intervals with barberry bushes. Over part of this I now pursued my way, descending after a time to the beach, which I found had dried out to a considerable extent, leaving broad sandy flats, on which I hoped to have found some live Magellanic Volutes, but as usual sought for them in vain, though the broken dead shells were strewed abundantly along high-water mark. I, however, obtained specimens of a *Bullia*, a *Natica*, a *Pecten*, and one or two other molluscs. Towards the close of the afternoon I ascended one of the high banks overlooking the

water, and there awaited the return of the others, enjoying the wonderful beauty of the surrounding scene. It was hard to decide whether the calm blue water of the Strait, with the opposite Fuegian coast stretching along the horizon, or the Gregory Range, diversified with exquisite lights and shadows, afforded the finer prospect. As the sun went down, the water towards the horizon assumed a delicate pale-green hue, while the sky above it was flushed with pale rose colour, and the Gregory Range became steeped in a rich dark purple. The advancing winter, however, distinctly proclaimed itself, for after the sun disappeared the air became decidedly frigid. Some teal, a *Bubo Magellanicus*, and a fox, were shot by the sportsmen of the party on this occasion.

Next morning (9th) I was to have accompanied one of the surveying officers on an excursion to the Fuegian coast, but I was balked in my intention, as the weather had completely changed, and it was blowing too hard to quit the ship. The 10th, however, was fine, and we left the vessel in the forenoon for San Isidro Point at the eastern entrance of the Fuegian side of the second Narrows, while she moved over to Philip Bay to take soundings. We arrived at our destination about noon, and found that the structure of the coast at the point at which we landed was rather remarkable, the beach forming a high shelving bank of shingle, with a flat top about three feet broad, while between it and the turf intervened a deep hollow of considerable extent, which at high-water was filled by percolation through the bank, so as to form a temporary salt-water lake, and at low tide almost dried out. Soon after going on shore we walked along the coast of the Narrows for some miles, as my companion wished to erect beacons at various spots; and while thus engaged we observed two vessels passing southwards, and contemplated

them with a good deal of interest, as at that time, when there was no regular service through the Strait, ships were rarities in these regions. We recognised many footprints of Fuegians, as well as of guanacos ; and a small species of lizard, a single example of which had been previously taken at Sandy Point, was rather common, running over the sandy soil, and concealing itself among the stones and scanty herbage. This was the *Ptygoderus pectinatus*, and I was a good deal interested by finding it in Fuegia, as Mr. Darwin has commented on the entire absence of any species of the class of reptiles from that country, though he remarks that it is not improbable that representatives might be found "as far south as the Strait of Magellan, where the country retains the character of Patagonia." What appears to be the same species I have since found was obtained by MM. Hombron and Jacquinot in Peckett Harbour, and named by them *Proctotretus Magellanicus*.* It is a pretty little creature, of a greenish or dark brown hue above, with in general five white longitudinal lines, with intermediate rows of angular black spots along the back and sides. I afterwards procured it in many localities in eastern Patagonia and Fuegia, discovering it at Port Gallegos, among other places. Though possessed of considerable agility, its movements are not so excessively rapid as those of many of the order to which it belongs, and I was in consequence able to capture a considerable number of specimens. We saw several specimens of the burrowing owl, one flying about our heads and uttering its peculiar note as we returned to camp in the dusk, and many broken crania of *Ctenomys* enveloped in a ball of hair were lying about, bearing evidence as to the nature of their destroyer. I picked up a few plants also,

* *Voyage au Pole Sud, Zoologie*, tome troisième, p. 6 ; Atlas, Rept. Saur. Pl. 2, Fig. 2.

including specimens of *Scutellaria nummulariæfolia* and the common mushroom, but met with nothing new in the botanical line.

On our return to the tent we had dinner, after which the evening was beguiled in reading, Ali Baba and the Forty Thieves being listened to with deep interest and occasional comments by the boat's crew; and, later, we lay down to rest, with arms as usual in readiness, in case of any hostile demonstration on the part of Fuegians. It was a wild, pitch-dark night, the sea roaring and raging on the beach, and a strong breeze blowing and shaking the canvas of the tent, on which heavy rain was pattering, while at intervals the wild cry of a sea-bird came across the water, producing a rather weird sensation. Soon after eleven P.M. we were roused by the watch announcing that he had seen a light, apparently carried by some one, pass rapidly along from the camp fire towards the boat, which intelligence caused us to spring up speedily and sally forth, revolvers in hand, to look for the enemy; but on investigation nothing was to be discovered, and we turned in again, to be disturbed, two hours later, with the information that the sea had reached the boat, which accordingly required to be hauled up out of danger. After this, we were left to sleep in peace, and next morning, when we rose early, the rain had cleared off. While preparations for breakfast were going on I walked along the beach for some distance, and obtained a fine live male and female of a short-spined or rather tuberculated species of *Lithodes* (*L. verrucosa*), which appears to be tolerably common in the eastern part of the Strait, as well as in Falkland Sound, where we subsequently found numbers. I also met with two or three specimens of an apparently new species of the genus *Serolis*, which I have named *S. convexus*.

On rejoining the ship, early in the forenoon, we found that a few newspapers had been procured from one of the ships which we had seen the day before, and we read with interest the account of the proposed Fenian attack on Chester, with many other details of events occurring at home.

On the 12th, a very fine day, after spending some time in the second Narrows, we anchored in Gregory Bay, where we remained for the next two days, as it was blowing too much to permit of work being accomplished. On the 15th the wind was again down, which allowed me to pay a second visit to the Fuegian coast with the officer who had been my companion on the former excursion. We started in the morning, taking with us the fox which we had had on board for some time, and which it was considered advisable to set at liberty, as it had been suffering for a considerable period from a form of skin-disease. Landing first at San Isidro Point, we let loose our four-footed friend, which at first appeared rather to experience "blank misgivings of a creature moving about in worlds not realised;" but by-and-by trotted off without manifesting any parting tokens of grief or affection. Here I found some specimens of a small green *Aphis* on the leaves of *Senecio candidans;* and after a flag which had been torn by the wind from a staff erected by us on our previous excursion had been replaced by a new one, we embarked and coasted along the edge of Philip Bay, landing now and then for the purpose of constructing beacons. We were agreed in thinking that we had never beheld a more uninteresting or monotonous piece of coast, the beach being steep and shelving, composed of innumerable small flattened stones, and presenting no prominent points; while the country beyond it, to all appearance, stretched inwards for a distance of nine or ten miles nearly

as flat as a board. At the last place where we went on shore, to put up a cairn, we were surprised by finding a long narrow tract of fresh water, apparently a mile or two in extent, running parallel with the beach, at a distance of about two hundred yards from it. Behind it was a long flat-topped ridge, about six or eight feet in height, and it was surrounded on all sides by a broad belt of vegetation, of a much greener and more luxuriant character than we had yet seen in eastern Fuegia. Many plants, which had passed out of flower more than a couple of months previously in drier situations, were still in bloom here, including the *Geum Magellanicum*, *Anemone decapetala*, *Epilobium tetragonum*, and a tall, stout, white-flowered Composite plant, common in marshy places in the eastern part of the Strait. A yellow-flowered viscid plant of the same order, apparently a species of *Madia*, which had not been previously seen elsewhere, was also procured; and, in addition to these, around the water's edge there extended a very distinct zone of a common species of *Acæna*, the *A. adscendens*. I have omitted to mention, up to the present time, what an intolerable pest we found the hooked achenes of the plants of this genus, abundant in the open country of the Strait, in our excursions—our clothes becoming covered with them, and much time and labour requiring to be expended in detaching them. I well remember the sorry spectacle presented by a large brown retriever, which was our ship's dog for a time, after a day's run over country covered with these obnoxious plants—his tail being one mass of burs, and hardly a handbreadth of the hair on his body free from the detached achenes.

Great numbers of teal were resting on the surface of the water, but speedily took wing, so that only a few were secured, which furnished an agreeable addition to our dinner.

We saw a considerable number of guanacos during this day, several of which, impelled by curiosity, approached to within a comparatively short distance of us, and then taking fright made off. We landed finally in rather a heavy surf, and pitched the tent for the night, rising next morning at daybreak, and after breakfast proceeding farther along the coast to the northward, which gradually assumed a more raised and undulating character. On landing, after a time, to erect a beacon, we observed on the top of a distant hill several human figures, which we at first supposed to be Fuegians, but presently discovered, by means of the telescope of the theodolite, to be the members of another surveying party, and accordingly set out to meet them. Our progress was, however, unexpectedly barred by the course of a narrow winding river too deep for us to ford. This, which was by far the largest body of running water which we encountered in the eastern part of the Strait, appeared to derive its source from a range of hills some miles inland; and I should much have liked to have made a thorough examination of its banks in search of plants, but this our time did not permit of. We therefore re-embarked, and proceeding a little farther onwards, were joined by the other party, one of whom, to my great satisfaction, had been so fortunate as to find a Fuegian cranium lying partially immersed in a pool of water. This, which is one of the very few Fuegian crania now in England, has been thus described by Professor Huxley. He observes that it

"Is in a good state of preservation, except that the nasal bones and the mandible are absent. The cephalic index is ·78; . . . . but as the last molar has not been cut, it is the skull of a young person, and many circumstances lead me to think it may be that of a woman. It is a curious circumstance that in this skull, as in that of the College of Surgeons, there are very large and prominent paroccipital processes,

which, as the remains of the cartilage which tipped them shows, would have become considerably larger had the owner of the skull reached maturity. The face is distinctly prognathous."

We rejoined the ship in the course of the afternoon, observing on our way to her several Fuegian fires on that part of the coast visited by us the day before. A number of the natives had been seen from the ship also. Certainly the faculty which these savages possessed, of approaching our tenting-places without being perceived, although a vigilant watch was always maintained by us, was very remarkable.

On the 17th the weather was unfavourable, and we all remained on board, the "Nassau," at this time lying at anchor in Philip Bay. On the afternoon of the 18th I landed with Captain Mayne on the coast, a few miles to the north-east of our anchorage. From the summit of a little hill which we ascended we noticed several guanacos at no great distance, with nearly black faces, a peculiarity which we had never remarked in those seen by us in Patagonia. In some rock-pools I obtained several small fish (species of *Notothenia*), and specimens of a tiny red *Actinia;* and on the beach I found some sponges and many dead shells of a species of *Crepidula* lying. It was a beautiful, though cold evening, and as we pulled back to the ship we witnessed a splendid orange-yellow moonrise. A few minutes before we got on board an owl lighted on one of the boats' davits, and was shot by one of the officers. It was a different species from those previously obtained, and possessed beautiful soft mottled-yellow and brown plumage, reminding one of the colouring of a large moth when the rounded wings were expanded. It proved to be the British short-eared owl, *Otus brachyotus,* and was the only example of this species that we ever met with in these regions. The same day one

of the men brought me a small live specimen of *Voluta Magellanica*. The morning of the 19th, Good Friday, was cloudy, with fine drizzling rain falling. Many Fuegians were observed watching the ship, but did not attempt to hold any communication with us. In the afternoon a party of us landed, and passed some hours on shore, but did not succeed in meeting any of these people, though we saw two of their dogs, which were large, rough, shaggy, black and white animals, about the size of the Newfoundland breed, which ran off rapidly on our approach. A little yellowish-green bird, which we had not previously noticed (the *Chrysomitris barbata*), was observed flying about in flocks near the ground, but none were obtained on this occasion. On the 20th heavy rain fell during the morning, and in the afternoon the weather was bright and clear, but blowing pretty hard. The wind continued during the two following days, and nothing particular took place. The Fuegians continued to watch the ship, and we saw several individuals, who had white feathers stuck in their hair, engaged in trampling down some of our turf beacons with their feet. The wind moderating on the afternoon of the 22d, we moved over to St. Jago Bay, and there anchored. The 23d was clear and bright, the Patagonian coast looking very beautiful, with its diversified lights and shadows, but it was blowing so hard that we could not leave the ship. Great herds of guanacos were observed not far from the beach. The following morning was calm and bright, with the air frosty, and a slight haze over certain portions of the land. Early in the forenoon a sail was announced, which by and by proved to be H.M.S. "Sutlej," on her homeward-bound course from the westward. She anchored for a few hours at a short distance from us, which allowed of our despatching a mail-bag by

her. Not long after her departure, late in the afternoon, I accompanied Captain Mayne on shore, as he proposed on the ensuing day to walk to a hill some distance inland, to obtain a round of angles from its summit. On the beach we met two of the officers who had landed earlier in the day, and were also to be of the party, learning from them that they had wounded a guanaco, and seen some ostriches at no great distance. I occupied the remainder of the daylight in a short ramble along the edge of a patch of fresh water visited by us some months previously, and picked up one or two additional plants. I passed over some large burnt patches of ground, on which I found the partially calcined humerus of a Patagonian charger lying. Many fresh footprints of ostriches were also to be seen. When I returned to camp on this fine frosty evening it was nearly dark, as the nights were now rapidly creeping in, and the appearance presented by our tents, illuminated by the flickering light of the fire, was very picturesque. On this, in common with many other occasions, the men spent a good part of the evening in singing ditties with tremendously vigorous choruses, varied by occasional recitative pieces, which appeared, judging from the amount of applause which they elicited, to meet with special favour, while we enjoyed a comfortable talk around the fire.

Heavy rain fell during the night, and at dawn on the morning of the 25th the appearance of the weather was so threatening, that it was at first thought that it would be necessary for us to defer our excursion until the following day. While we were at breakfast, however, the sun shone out brightly, dispelling the heavy clouds, and the horizon by degrees cleared, so that we determined to set forth. Accordingly, about half-past nine A.M., we started, our party

consisting of Captain Mayne, two officers, and myself, together with four men employed in carrying rifles, surveying apparatus, etc. The ground, though undulating, and in occasional situations swampy, proved to be well adapted for pedestrianism, as we soon got beyond the region of rat-burrows, which appear to be limited to the immediate neighbourhood of the sea-coast; and the air was perfectly still, with a decided tinge of frost. On our way we saw several droves of hundreds of guanacos in the distance, and one or two stragglers were fired at with rifles, but without success. Some small flocks of *Attagis Falklandica* were also seen, and a single specimen procured. In the way of plants almost the only novelty encountered was a curious little Gasteromycetous fungus, belonging to the genus *Geaster*, of which we have one or two representatives, more or less local in their distribution, in Great Britain. The general form of the plant may be roughly described as consisting of a small rounded ball, about the size of a bullet, attached to a flat, lobed, starlike plate, the rays of which are spread out on the sandy soil, curling up when they become very dry.

Near the foot of the hill which was our destination we crossed a rivulet of deliciously cold water, of which we drank and were refreshed, thereafter beginning the ascent, in the course of which we startled an ostrich, which rose out of the long grass about ten yards ahead of us, and went off at a great pace. At the top of the hill we found the vestiges of an old cairn, probably erected by King or Fitzroy while engaged in their surveys of the same regions about thirty years before; and on a large boulder, which contained several small pools of water in the hollows in its surface, I found a single specimen of a minute species of earwig (*Forficula*), similar to one obtained by one of the officers in Fuegia

a few days previously. We obtained a fine panoramic view of the country on all sides of us, as well as of the opposite coast of Fuegia; and after the surveyors had obtained the angles they wished, and a large beacon had been erected, we descended, and, having lunched at the edge of the stream already mentioned, began the return journey of ten or twelve miles.

It was dusk when we approached our camp, and one of the men left in charge, coming to meet us, informed us that a party of about thirty Patagonians had arrived some hours previously, and encamped on one of the high banks in our vicinity, and that some of the officers left on board the vessel had landed to communicate with them. On reaching the spot, a few minutes later, we found a striking group of these people, consisting of men, women, and children, assembled round our camp fire, some watching the cooking of our dinner with curiosity, while others were engaged in prying about the tents. They had brought two freshly-killed ostriches with them, and these they handed over to us in exchange for biscuit, etc. The chief in command, Cacimiero Biwa by name, was a tall, very strongly-made man, of about forty-five or more, and his flowing robe of guanaco-skins caused him to appear of great size. He spoke no English, but talked Spanish fluently, and explained to Captain Mayne that if we would remain on shore during next day he would take us out on a guanaco-hunt. This proposal was agreed to after some deliberation, and the chief then asked how many horses we would like, saying that he could give us twenty or thirty readily, as he had between forty or fifty with him. He was, however, informed that eight or nine would be sufficient. He then gave us a great deal of miscellaneous information about his people

only a part of which we could comprehend, and further told us that he was a colonel in the service of the Argentine Republic. He sat with us in one of the tents while we were at dinner, after which, under his escort, we paid a visit to the Patagonian camp, which consisted of a row of tents formed of guanaco-skins supported on poles, open in front, where they were about seven feet high, and gradually sloping down towards the back, which did not exceed three feet in elevation. On our approach we were saluted with the loud baying of dogs of all sorts and sizes, and for the most part of very ugly appearance. The inmates of the tents came out to receive us in a polite manner, thereafter conducting us into their dwellings, from the roofs of which, at the entrance, dangled rows of strips of ostrich and guanaco meat hung up to dry. From other parts of the roof many beautiful skunk-skins were also suspended, which diffused anything but an agreeable odour. In one of the tents a woman was rocking a rough cradle, formed of pieces of wood lined with skins, in which was contained a baby with a thick crop of black hair. Our attention was also attracted by the ridiculous aspect of some hideous little pet dogs, apparently much prized by their owners. They were entirely naked, with the exception of the crown of their heads, which were sparsely covered with white hair, contrasting strangely with the dark hue of the body, and they had little guanaco-skin cloaks tied around them to keep them warm. Our visit over, we returned to our own tents, glad to be rid of the company of our friends for a while, and after spending some time by our fire, retired to rest.

Next morning we rose between six and seven, much pleased to find that the state of the weather was everything that could be desired for the day's campaign, being bright,

still, and rather frosty. Setting out on a stroll by myself before breakfast, I had a cold but refreshing bathe, which effectually removed the stiffness induced by the long walk of the previous day, and then walked for some distance along the edge of the strip of fresh water near our camp, where I found a Patagonian engaged in washing—a proceeding apparently but rarely indulged in by these people. After we had respectively saluted each other with the customary "buenos dias," he made some remark in Spanish which I did not catch, and consequently had recourse to the usual "no entiende," whereupon, to my no small amusement, I met with the emphatic rejoinder in English, "Wash your face"—a piece of advice one would have hardly looked for from an individual of this nation. At the close of breakfast we were joined by four officers from the ship, and we then proceeded to make preparations for the start. Horses were to be had in plenty, but horse-furniture was by no means so readily attainable, so that a considerable amount of time was expended in preparing make-shifts for saddles, bridles, and stirrups. The Patagonian saddles consist of wooden frames, provided with a high ridge before and behind, and on these the riders place a pile of skins, on which they sit. But few skins being available, however, for our behoof on the present occasion, pillows, rugs, blankets, and cloaks, were brought into requisition, and arranged according to the particular fancy of the rider. Stirrups were also with difficulty procured, in illustration of which, I may mention that I was furnished by a Patagonian with one so small that I could hardly get the point of the toe of my boot into it, while another was improvised for me by Captain Mayne's coxswain out of a piece of rope-yarn. While we were getting ready, Cacimiero, who had previously made his appearance at breakfast

attired in his gorgeous Argentine uniform surmounting a very dirty white shirt, and who had unfortunately imbibed more rum than was good for him, explained to Captain Mayne that he himself could not accompany us, as he was "medio borracho" (rather drunk). He, however, lent the captain his steed, arming him with a pair of formidable Mexican spurs, and informed us that a subordinate chief, named Camilo, would act as our guide on the occasion.

Every one being at length in the saddle, we set forth—the party consisting of Captain Mayne, six officers, myself, and half-a-dozen Patagonians, who were accompanied by an equal number of smooth-haired piebald dogs, about the size of foxhounds. All the Indians were armed with the bolas, in addition to their large hunting-knives, which were in general carried in sheaths in their horse-skin boots, and Camilo further possessed a revolver, which, however, appeared as if worn more for ornament than use. The horses with which we were supplied were of rather small size, but very fleet and sure-footed, and we started at a smart pace, two of the Patagonians occasionally riding on in front to reconnoitre. At length a small herd of guanacos was descried in the distance, and thereupon four of the Indians, accompanied by four of our party, rode off to circumvent them, while the remainder of us halted for a short time, and then moved on slowly, so as to be ready to intercept the animals when they were driven down the slope of a neighbouring hill in front towards us. We had not to wait long ere four of them appeared, tearing along with the dogs at their heels, and followed at a short distance by the horsemen. Receiving a signal from our guide to advance, we dashed forward, the horses going like the wind, and apparently as much excited as their masters. It was a spectacle

not readily to be forgotten, to behold Camilo riding along ahead of us at full speed, naked to the waist, his guanaco robe being thrown off his back and shoulders, his black hair streaming in the breeze, and his bolas revolving rapidly in the air above his head. Waiting until he had come within fifteen or twenty yards of the animal which he had selected as his victim, he discharged the missile, which, flying through the air, struck the guanaco, winding round and round its hind-legs so as to lash them firmly together. The poor creature, however, still managed to flounder on for a few yards, but then stumbled and leapt in the air, when its captor, springing from his horse, dragged it to the ground, and stunned it with a blow on the head from one of his balls. A second was secured by another of the Patagonians, who finished it by drawing his long knife across its throat; and a third, which was a young individual, was caught a few minutes later, and preserved alive. The fourth and last, after being pursued for a long distance, escaped in safety. On subsequent reflection, it appeared somewhat surprising that no bipeds suffered on this occasion in addition to the quadrupeds, as one or two of the riders who carried revolvers, in the excitement of the chase wildly discharged them in all directions, without much regard to the safety of their neighbours.

When we had all assembled, we dismounted from our steeds, and witnessed the operation of eviscerating the two animals which had been slaughtered, a process very speedily accomplished. Drawing out their long triangular-bladed knifes from their sheaths, and after giving them a few preliminary wipes on the steels which they always carry with them, the Patagonians made a long, clean incision along the middle line of the breast and abdomen of the guanacos,

which had been previously laid on their backs, and then cut through the costal cartilages, so as to separate the ribs of each side from the breast-bone, and expose the thoracic cavity. The viscera were then cleared out in the course of a minute or two, jets of blood spouting from some of the larger wounded vessels, and the stomach, intestines, liver, and lungs thrown to the dogs, who fought over them, and speedily made them disappear from view. The kidneys were extracted separately, and the tunica albuginea having been stripped off, they were eaten, bloody and smoking hot as they were, by the butchers, who evidently regarded them as tit-bits. The carcasses were then turned over to let the blood run out of them, the process being facilitated by a few stamps from the feet of the operators, after which, in common with the young live animal, they were slung across the backs of horses, and sent back to camp with two of the Patagonians. After we had rested for a little while, we rode off to see if we could come across the guanaco that had escaped. We found, however, that it had fled too far to allow of our following it without much expenditure of time and very doubtful results, and accordingly rode back to camp. On the way our guide, who was possessed of a remarkably prepossessing expression of countenance, and appeared very amiable, pointed out "ostrich" to us, which was scudding along over the plains, with some of the other members of our party, who were in advance, in pursuit, but it got off without damage. We reached the tents about 1 P.M., and as the appearance of the clouds was strongly indicative of rain, which later in the day came on heavily, we struck our camp, and returned to the ship. The two chiefs accompanied us on board, where they spent about an hour, being regaled with luncheon in the ward-room, and behaving, on the whole, with great discretion, using their knives and

forks in the most approved manner. Both of them had several times visited Buenos Ayres, which probably accounted for these amenities. On their departure they shook hands with us, and Cacimiero, who had considerably exceeded in the way of liquor, warmly pressed one of the officers to take a wife from his camp, being also extremely desirous that a black quartermaster should come on shore with him, embracing him in the most affectionate manner, so as to furnish rather an amusing commentary on Fitzroy's statement (probably derived, like the greater part of his information regarding the Fuegians and Patagonians, from a Mr. Low, captain of a sealing vessel), that "Patagonians have a great antipathy to negroes."

On the evening of this day on which we had had such an interesting experience of savage life, it came on to blow very hard, and there was a good deal of wind throughout the following day. We remained at our anchorage until the 29th, when we shifted to Gregory Bay. The 30th was a day of most perfect beauty, perhaps the finest of the season, being splendidly clear, bright, and calm; one of those seasons at which one feels the vital powers at their highest pitch. In the afternoon Captain Mayne and I landed, and walked for some miles inland along the plain stretching between Gregory Range and the high ground of the second Narrows, as we were anxious to ascertain whether some Patagonians, who had been observed from the ship in the morning, were still in the neighbourhood. We saw a number of upland geese, as well as some specimens of the *Ctenomys* at the entrance of their burrows, apparently enjoying the warmth of the sunshine. Some of the officers, who were also on shore, shot some duck of a crested species which we had not previously observed, and also three flamingoes, one of which was handed over to me. This was a young specimen of the *Phœnicopterus igni-*

palliatus, which is, I believe, common in Chili and the northern parts of Patagonia, and the Argentine Republic. Mr. Darwin remarks that he observed these birds wherever there were lakes of brine. Apparently they are but rare in the neighbourhood of the Strait, for this was the only occasion on which we observed specimens. We cooked two of them, but found them extremely fishy, probably owing to the fat, of which there was a considerable layer on the muscles of the breast and abdomen. The plumage was chiefly composed of sombre gray and brown tints, but on the inside of the wings there was a lovely pale rosy hue, recalling a dying sunset flush. I was greatly interested in the examination of the peculiar tongue, dishes composed of which were highly esteemed in the luxurious times of the Roman Empire, and whose structure has been carefully described by Professor Owen, who remarks that its substance "is not muscular, but is chiefly composed of an abundant yielding cellular substance, with fat of an almost oily consistence."

To employ the language of the above distinguished anatomist—

"It is almost cylindrical, but slightly flattened above, and obliquely truncate anteriorly, so as to correspond with the form of the inferior mandible. The lower part of the truncated surface is produced in a pointed form, and is supported beneath by a small bony plate. . . . . Along the middle of the flattened superior surface there is a moderately deep and wide longitudinal furrow, on either side of which are from twenty to twenty-five recurved spines, but of a soft and yielding texture, measuring from one to three lines in length. These spines are arranged in an irregular alternate series, the outer ones being the smallest, and these indeed may be considered as a distinct row."

On the 1st of May one of the officers who was on shore brought me, on his return, a specimen of a pretty species of finch (*Phrygilus Aldunatii*), with yellow and grayish-blue

plumage, several small flocks of which had been noticed by him. This day H.M.S. "Spiteful," despatched from Monte Video with supplies of coal and provision for our behoof, was due, but she did not make her appearance. The weather had been very fine for the last few days, so as to be eminently fitted for surveying operations, which made us regret all the more that our coal was getting so low as to allow of very little expenditure of it in moving from place to place. I had a pleasant walk on the afternoon of the 2d, without, however, noting anything of great importance. I found a species of *Sisymbrium* (*S. Sophia ?*) growing very plentifully on low ground near the sea, but nearly out of flower ; and one of the officers shot a specimen of a small species of sandpiper, the *Ægialitis Falklandica.* We remained stationary in Gregory Bay until the 6th, when we left for Sandy Point to obtain a load of wood for fuel, as there was no appearance of the missing vessel; and we began to realise that if she did not turn up soon, a second excursion to the Falkland Islands, a result by no means to be desired, would be necessary. On our southerly way we noticed a party of Patagonians riding along the beach not far from Cape Negro. We did not reach our destination until some hours after dark, when a rocket was sent up to indicate our approach to the inhabitants of the settlement, who in return lighted large fires not far from the beach.

Early on the following day a number of us landed, dispersing in various directions—one of the party, along with myself, taking a long walk through the woods in search of fungi. The trees had now assumed brilliant autumnal tints, and the vivid golden yellow of the foliage of some contrasted finely with the rich russet colouring of others. It was a perfectly still, somewhat cloudy day, with the leaves quietly dropping down from the boughs, and adding to the carpeting

on the ground, and there was much to remind us of a walk through a wood in autumn in England. At one point in our route we had a severe struggle through a thicket of holly-leaved barberry, many of the plants of which attained a height of more than twelve feet. Here and there, at the tips of the tallest branches, were corymbs of the beautiful large bright orange flowers, appearing at a little distance like tongues of flame. As I have already remarked, this barberry appears to have two distinct times for flowering, one in early spring and the other in autumn. But few birds were to be seen, with the exception of the little *Oxyurus*, small groups of which accompanied us wherever we went, their sharp notes being almost the only sounds to break the silence of the forest. A woodpecker was shot high up in the fork of a tree, and fell on the ground, but we could not find it. We collected a considerable number of fungi, including about a dozen species not previously obtained by me. The greater number of these were *Agaricini*, ranging in tint from snow-white to orange-tawny and mauve-purple, but representatives of other tribes were also tolerably plentiful. Thus a *Tremella*, allied to if not identical with *T. mesenterica*, formed large masses on the stems of some of the trees, and an orange-yellow *Exidia* was common on dead branches, while the yellow spheres of *Cyttaria Darwinii* were to be seen in quantities. On emerging from the woods in the course of the afternoon we were much pleased to see the "Spiteful" lying alongside the "Nassau," and somewhat surprised to observe another steamer approaching from the westward, which last proved to be the Pacific Steam Navigation Company's vessel "Peru," on her way to England. On the open ground not far from the settlement we met several Patagonians, forerunners of a large party who arrived two or three days later. One of these had a triangular purple

mark painted on his face, the base of the figure passing immediately beneath the eyes, and the apex coinciding with the tip of the chin. I do not know whether this colour was produced by barberry juice or by a mineral substance, as they possess a variety of coloured clays, with which they inscribe patterns on the outer (hairless) side of their mantles. This operation is carried on by the women, who stretch out the robes tightly on the ground with small wooden pegs, so as to form a flat surface on which to work. We held a little converse with these people in very fragmentary Spanish, and they requested "Pólvora" (gunpowder), which they imagined I possessed in one of my vascula; so, to satisfy them, I opened the case, and displayed to their wondering eyes my collection of mosses and fungi. At the governor's house we were shown two fine puma cubs which had been brought in by the Patagonians. They were very powerfully-made little animals, with fine large eyes and soft gray fur, and they scratched and bit at us with great determination when we attempted to handle them, fighting with one another also for scraps of raw meat which were thrown to them. On going on board, I found that specimens of a beautiful little owl (*Glaucidium nanum*), new to us, as well as of a harrier (*Circus macropterus*), previously procured at Maldonado, had been shot by two of the officers (Dr. Campbell and Mr. Bedwell), whose skill as sportsmen yielded me the majority of my ornithological prizes.

The "Spiteful" had brought us an abundant supply of letters and papers, which were very welcome, as we had had almost no news for nearly three months past, and supplied us with topics of conversation for some time to come, as well as material for occupying our evenings, which were by this time getting very long. On the 8th and 9th it rained nearly all day, and I remained on board skinning birds and drawing

fungi. A small ray, taken in the seine of the "Spiteful," was brought to me by one of the officers, and afterwards proved to be the type of a new genus, which Dr. Günther has denominated *Psammobatis*.* On the 10th we began to take in coal, and accordingly nearly all the officers spent the afternoon on shore, a football-match being played between the representatives of the two ships, and contemplated with much curiosity by the Chilian inhabitants of the settlement. A specimen of a most beautiful species of teal was this day shot by one of the officers of the "Spiteful," and very kindly presented to me by him. This was the *Querquedula cyanoptera*, and the only example of the species ever seen by us in the Strait. Captain King, who briefly described it under the name of *Anas Rafflesii*, gives the "Strait of Magalhaens and western coast to Chiloe" as localities where the species occurs, but does not state whether he often met with it, and it had never been previously observed by the governor of Sandy Point, to whom I exhibited it. The principal colour of the plumage of the body is a rich chestnut-red, with small circular black spots, and the wings are exquisitely coloured with beautiful shades of green and blue. In the course of the afternoon I visited, in company with several of the officers, the Patagonian camp, situated near the north bank of the river. From some of the tents we heard a lugubrious chanting proceeding, a sure indication that the inhabitants had been partaking freely of rum. The first man encountered by us was our old acquaintance Pedro, who, after asking one of our party, "What man you?" inquired of us each in turn, "You the Capitan?" On one of the officers informing him that I was "un medico," he introduced me to the medical practitioner of the tribe, who grinned in a complacent manner. Pedro then

* British Museum Catalogue of Fishes, vol. viii. p. 470.

told me that there was "man very much kill with fire," adding, "you like to see him?" to which I returned a decided negative, imagining that it was a burnt carcass which was proposed to be submitted to my inspection. However, he repeated his remark, adding very earnestly, "You come with me and see him;" and I at length gathered that the man was alive, and had been burned in consequence of lying too close to the fire when in a state of intoxication, and consented to go and see him. Pedro accordingly conducted me to a wooden shanty where the unfortunate sufferer was lying, telling me on the way that he had visited the "Malouines" (Falkland Islands), and asking, "You know Mr. Tirling? he great friend of mine." After a little consideration I arrived at the conclusion that Mr. Stirling, the energetic missionary to the Fuegians, and now Bishop of the Falkland Islands, was meant. On reaching the hovel and opening the door, the only object at first presented to my view in the darkness (for windows there were none), was a smouldering wood-fire. However, on Pedro's addressing some invisible individual with a command, which he translated for my benefit, as "Make candle," a torch was produced, by the light of which a number of women, children, and dogs were disclosed, as well as a handsome young man lying on the ground near the fire, wrapped in his guanaco robe. It was then explained to him that I had come to see him, and the burn forthwith exhibited. It was not a very deep one, but extended for more than a foot along the outside of one thigh, and was evidently very painful. I felt much at a loss to tell them how to treat the poor fellow, as they have so very few appliances, but endeavoured to explain that they must keep the burnt surface free from dirt, and laid a pocket-handkerchief moistened with water over it, securing it with strips of guanaco-skin.

I then departed, receiving a "gracias" from the sufferer, to which Pedro, evidently resolved to display his English to the utmost advantage, added an emphatic "Tank you, sir." I then endeavoured to improve the occasion by telling him that it was not good to take much rum, but I fear with little effect, as Pedro stoutly asserted that "rum *very very* good." On our way to the boat we met Cacimiero, who gave plain evidence that he had been imbibing, and laying his great dirty hand on my shoulder, commenced an oration apparently descriptive of the glory of his tribe, from which I had some difficulty in making my escape.

The 11th was a glorious, clear, frosty day, and we had a splendid view of some snowy peaks nearly a hundred miles distant. A fine male of the *Campephilus Magellanicus*, together with a few other birds, was shot by one of the officers in the woods near the settlement. The weather continued frosty for the next day or two, ice being found on one or two spots on deck, and the thermometer sinking considerably below the freezing point. After this we had a good deal of rainy weather, and there were many evident tokens that before long we must wind up our work for the season, and proceed northwards to Rio, where we had received instructions to winter. We left Sandy Point on the morning of the 17th, in company with the "Spiteful," and passed north-eastwards, taking lines of soundings as we went, and anchoring in the afternoon in Royal Roads. The next day was very fine, but cold. The dredge yielded some minute Molluscs, Crustacea, and Annelids, a few of which were new to me. We left Royal Roads and moved onwards, anchoring in Gregory Bay at the close of the day. In the evening the moon rose magnificently, appearing as a large orange globe hanging in the air, in front of a pale green sky, while beneath it was a band

of dark cloud silvered on the edges. On the 19th we remained at anchor. It was a fine bright day, though with a very cold wind blowing, and the coast of the bay was finely displayed in mingled light and shadow. One of the officers, who landed in the afternoon, shot a fine specimen of *Buteo erythronotus*, and two small finches, the *Chrysomitris barbata*, flocks of which we had previously seen on several occasions. On the 20th the weather was so bad that we did not make a move; but on the following morning, which was clear and frosty, with the surface of the water like oil in point of smoothness, a good deal of work was accomplished. We parted company with the "Spiteful" early in the day—she, her work having been accomplished, proceeding eastwards out of the Strait, on her way to the Falkland Islands. A very dense white mist descended in the course of the forenoon, and lasted for more than an hour, concealing the shores of the Strait from view, and thus suspending our operations. We had intended to pass through the first Narrows, but an untoward easterly breeze sprang up, causing us to come to an anchor in St. Jago Bay, between four and five P.M. In the course of the evening it came on to blow hard from the S.E., and blew with great violence all night, accompanied with drifting rain. Next day matters were not at all improved, as it was blowing hard, with driving rain from between E. and N.E., causing us to roll unpleasantly, while snow fell on the low grassy hills not far off. On the 23d the rain and snow had ceased, but it blew hard all day, and was very cold. The wind, however, fell at 9 P.M., when the moon rose; and the 24th was a very fine though cold day, hard frost having set in. The ship was employed in taking soundings in the first Narrows, and two officers were landed near Direction Hill, to do some work on shore. The 25th

was occupied in a similar manner. The thermometer was +27° in the morning, and the day was a splendid one, perfectly still, and very bright—the snow-clad hills sparkling in the sunshine. The frost continued hard, and the air still, during the 26th and 27th, on the latter of which days we were rejoined by the shore party, who had suffered considerably from the cold; but on the morning of the 28th it was again blowing hard from the eastward, with heavy showers of snow and rain. Rain set steadily in during the course of the afternoon, and on the two following days it was blowing too hard to allow of our leaving our anchorage in St. Jago Bay. The night of the 30th was calm and fine, but on the morning of the 31st the wind again arose from the southward. We weighed, nevertheless, and soundings were taken, in the early part of the day, along the coast of Philip Bay. While thus engaged we noticed a considerable number of Fuegians walking along near the beach, accompanied by their dogs, and most of them carrying large bundles composed of drift-wood and dry grass on their shoulders. Owing to the wind being right against us in the afternoon, we were unable to return to our anchorage, and obliged to run through the first Narrows, and anchor in Possession Bay. The wind increased in vehemence during the evening, and throughout the night it blew very hard, causing us to roll to an extent greater than we had yet experienced in the Strait.

The 1st of June was very clear and bright, but it was blowing from the S.W. all day, so that we remained stationary. Mount Aymond and the Asses' Ears, being covered with snow, presented a sharp contrast with the low undulating land in our vicinity, which was covered with grass of a pale yellow colour. The wind fell in the course of the 2d, but on the 3d it again arose and blew pretty hard. While busily

occupied in my cabin on this day, in the examination of my dried plants, I was summoned by one of the officers to behold a marvellous spectacle, in the shape of a huge snow-cloud, like a solid leaden wall, which descended vertically from the sky to the water, and gradually swept up to the ship. By this time we had received abundant evidence that the winter had set in fairly, as it was getting much too cold to despatch surveying parties on shore, unless they had been equipped in arctic garb, with which they were not provided; and it was therefore determined that, after paying a final visit to Sandy Point to obtain a set of sights, we should bid good-bye to the Strait for the season. On the 4th, therefore, the wind being at last down, we weighed in the morning, and passed through the first Narrows, anchoring soon after four P.M. in Gregory Bay. The sunset that evening was very striking, the sun descending as a fiery red globe behind the snow-white Gregory Range; and the sunrise next morning was also remarkable, a wide space of pale greenish-yellow sky on the horizon being surmounted by piles of scarlet and rosy cloud. We left our anchorage early, but the wind arose soon after breakfast, so as greatly to retard our progress southwards, although we had the tide in our favour. Two seals were seen close to the ship for a few minutes in the course of the forenoon. We anchored, at half-past two P.M., off Cape Porpesse, and a party landed immediately after; Captain Mayne, one of the officers, and myself, walking over the high ground on the summit of Cape Porpesse and Cape Negro to Laredo Bay. The range of cliffs, formed of boulder-clay, extending between the two capes, is high and precipitous, and presents a series of projecting ridges, with intervening deep furrows; and the high ground behind it (the beginning of the wooded country) is covered with a thick brushwood, formed principally of tall bushes (*Ribes*

Voluta Magellanica

Magellanicum, Pernettya mucronata, Fagus antarctica, Chilabothrium amelloides, Embothrium coccineum, and *Maytenus Magellanicus*). The last-named plant, belonging to the natural order *Celastraceæ,* is common in the wooded region, where it forms a low tree, with rather slender branches, which bear ovate-elliptical, coriaceous, serrated evergreen leaves, and obscure greenish flowers. Here, owing probably to its exposed situation, it occurred in the form of compact rounded bushes, as symmetrical in form as if they had been artificially trimmed with gardening shears. It was a bright, frosty afternoon, and the walk over the hard frozen ground was very agreeable. We observed a flock of carranchas perched on a clump of bushes, and a number of pretty little crested birds, like tits, were hopping about, making a loud chirping. These were specimens of the *Anœretes parulus,* which, according to Mr. Darwin, is also common in central Chili. Subsequently I noticed it throughout the Strait and Channels, and also in the island of Chiloe, but I never saw it in such abundance as at Cape Negro, on this occasion. Some good specimens of a fern, *Aspidium mohrioides,* which also occurs at the Falkland Islands, were found by one of our party in a ravine in the cliffs; and it is worth noting, that this was the sole locality in the Strait where we encountered it.

We left early next morning for Sandy Point, finding on our arrival that the greater part of a wooden pier, which had been constructed at the landing-place, had been carried away by the recent gales, which had covered the beach with great masses of kelp. A large party of us went on shore in the forenoon, and I walked with one of the officers about five miles along the coast to the southward of the settlement. All the small streams and some large patches of fresh water were thickly covered with ice, and the sandy beach was frozen hard. Numbers of damaged shells of *Voluta Magel-*

lanica and *Triton cancellatum* were lying scattered at high-water mark (many of them containing their inmates), together with portions of the membranous tubes of a very large Annelid, fragments of *Lithodes antarctica*, and many specimens of *Eurypodius septentrionalis;* and a single individual of a very curious little crab, the *Pinnotheres transversalis*, was also found. Many terns and gulls were seen; and one of the latter (*Larus dominicanus*), which reminded me of our British lesser black-backed species, was shot. A specimen of a curious little grebe (*Podiceps Rollandi*), very common in the Strait, but difficult to shoot on account of its activity in diving, was in addition procured, being found by one of the officers frozen into the ice of a small stream.

A heavy surf on the beach prevented us from landing for the next day or two; but on the 10th, a bright, sunny day, I had another long walk, obtaining some more marine animals, and, among others, many examples of a very large new species of *Echiurus*, which has been named by Dr. Baird *E. farcimen*, on account of its sausage-like appearance. Some of the specimens measured upwards of a foot in length, by between five and six inches in circumference; and they appeared to possess the faculty of altering their form in a very marked manner. On the evening of the same day, all our preparations for a start having been completed, we took advantage of the moonlight to proceed as far as Laredo Bay, where we halted for the night. Next day we moved on as far as Baxa Point, at the Fuegian side of the entrance of the first Narrows; and on the 12th we went slowly on our way to the eastward, taking a line of soundings. We passed Dungeness Spit about five P.M., and bid farewell to the Strait on an exquisite moonlight night, proceeding on our northerly course under steam and sail.

CHAPTER VII.

VOYAGE TO RIO—REMARKABLE STOMACHS OF PETRELS—FLIGHT OF ALBATROSS—ARRIVAL AT RIO—FLOWERS IN THE GARDENS—MANATEE—MARKET—TANK-ROAD—TWINING FERNS—TREE-FROG—EXCURSION TO RODEIO—DOM PEDRO RAILWAY—SERRA DEL MAR—REMARKABLE CREEPERS AND EPIPHYTES—OPOSSUMS—CORAL-SNAKE—GIGANTIC TREE—BULIMUS TAUNAISII—EXCURSION TO TIJUCA—CASCADES—ENORMOUS BOULDERS—BARRACHUTAS—DISCOVERY OF FRESH-WATER CRAB WITH LIVE YOUNG—EXCURSION TO PAQUETA—PITANGA BUSHES—ANIMALS FOUND ON SCREW OF "NASSAU"—SWIFT-RUNNING CRABS—GALLINAZOS—SAUBA ANTS.

Our northerly voyage was prosperous, all things considered, but far from eventful. The morning of the 13th of June dawned clear and bright, and, as we had a fair wind, the screw was got up early, and we proceeded onwards under sail throughout the day, at a rate of from six to eight knots. During the night, however, the breeze died away, and by the morning of the 14th it was nearly calm. Many Cape pigeons (*Daption capense*) were observed flying about the vessel, and swimming in the water in our immediate vicinity, on the look-out for anything in the shape of food that might be thrown overboard; and these beautiful birds were our companions during the greater part of our passage. A specimen of a larger species of the same tribe, with ash-coloured and white plumage, the *Fulmarus glacialioides*, was taken on a line put out astern on this day; and I preserved the skin and the digestive organs, which latter I

subsequently compared with those of specimens of the Cape pigeon, afterwards obtained, with the following results:— The entire length of the alimentary canal in *Fulmarus glacialioides* I found to be 85 inches, and that of the intestinal tract, taken by itself, 74·5 inches. The cæca measured three lines in length, and were situated two inches above the anus. The stomach was distinctly divided into a cardiac and a pyloric portion, separated by a short and narrow interval. Of these portions, the cardiac division possessed a comparatively feeble muscular coat, and was remarkably glandular; while the pyloric, of a somewhat flattened spheroidal form, was extremely muscular. The former I found distended with a firm mass of semi-digested ship-biscuit; while the latter contained the two mandibles of a small Cephalopod. In the Cape pigeon, on the other hand, the length of the entire alimentary canal was 46 inches; that of the intestinal tract 34·5 inches. The œsophagus enlarged much more abruptly to form the cardiac portion of the stomach than was the case in the Fulmar; and the muscular coat of that portion was considerably thicker, so that the gastric glands were not visible through it. The pyloric division was much more feebly developed than in the Fulmar, but the diameter of the intestinal canal was considerably greater than in that species. The stomach of one of the specimens examined contained ship-biscuit, and that of another a piece of pork-rind, so large that it must have distended the œsophagus greatly in its passage downwards.

The wind freshened up again in the course of the forenoon, so that we made good way throughout the day. It lasted on the 15th until the evening, when it died almost completely, and there was a cloudy sky, with a good deal of fog along the

horizon. Next morning it was still dead calm, and drizzling rain fell for some time. Many Cape pigeons, a few Fulmars, and one or two albatrosses (*Diomedea exulans*), were seen all swimming together in a group at no great distance. The calm lasted all day, and during the earlier part of the 17th, and we had therefore again recourse to steam. We went along at an easy rate in this manner till the close of the afternoon, when a favourable breeze sprang up, and soon after enabled us to dispense with our useful but disagreeable auxiliary—the screw. On the 18th we maintained a good rate of speed all day; but, owing to a heavy swell, the vessel rolled to such an extent as to render work, which on my part principally consisted in preparing the specimens obtained during the past season for transmission to England, almost impracticable. The morning of the 19th was beautifully bright, and we began to experience a decided increase in the temperature, causing us to realise that we were leaving winter behind us. It was, however, nearly calm, and when the wind sprang up again after sunset, it was unfortunately ahead, so that we were obliged to tack. A magnificent albatross was soaring about at a short distance astern for some time in the afternoon, and was knocked over, but unfortunately not picked up. All those who have watched those splendid birds must have been struck with the marvellous nature of their flight, as they may often be seen sailing about for more than an hour at a time without any apparent movement of their long narrow wings, and will, I doubt not, agree with a well-known ornithological observer, Captain Hutton, who has remarked that he has never "witnessed anything to equal the ease and grace of this bird, as he sweeps past, often within a few yards, every part of his body perfectly motionless, except the head and eye, which turn slowly, and seem to take notice of everything."

A good deal of discussion has arisen as to the method by which this sailing flight is maintained, and perhaps the question can hardly be considered as fairly settled. Dr. Pettigrew has observed, in his interesting and valuable memoir, *On the Mechanism of Flight*, that in sailing or gliding birds "the pinion acts as a long lever, and is wielded with great precision and power, particularly at the shoulder."

And further, that a careful examination of the movements of skimming birds has led him to conclude—

"That by a judicious twisting or screw-like action of the wings at the shoulder, in which the pinions are alternately advanced towards and withdrawn from the head in a manner analogous to what occurs at the pelvis in skating without lifting the feet, birds of this order can not only maintain the motion, which they secure by a few energetic flappings, but, if necessary, actually increase it, and that without either bending the wing, or beating the air." *

Whether, however, this is a correct or sufficient explanation of what appears at first sight a very perplexing phenomenon, I do not venture to offer any opinion.

During most of the 20th we were greatly off our course, beating in towards the land. On the 21st we noticed a stormy petrel (*Thalassidroma Wilsonii?*) for the first time, and on the afternoon of the following day a number of petrels of another species, brown above, and white beneath, with the exception of the throat, which was dark-coloured, were observed flying about astern. We remarked that they soared at a much greater elevation than either the Cape pigeons or Fulmars. We never noticed them light on the surface of the water, and their wings appeared proportionally much longer and narrower. Immediately after the sun went down there was a magnificent flush on the sky, which, at first pale pink,

* *Linn. Trans.* vol. xxvi. p. 258.

gradually deepened to rose colour, and finally to carmine. About a couple of hours after sunset a remarkable elevation in the temperature of the sea-water, due, in all probability, to the Plate current, was recorded. On the 22d the wind still continued unfavourable, and the vessel pitched severely. Some large black petrels were seen, closely resembling a species occasionally noticed by us in the Strait. The 24th was very mild and warm, with the wind rather variable. Early on the morning of the following day, when we were in the latitude of Monte Video, several flying-fish were observed. There was but little wind during the earlier part of the day, but a little before noon a fresh breeze sprang up, which carried us along at the rate of about eight knots, till the evening, when it became lighter. On the 26th, a charming sunny day, we made from four to five knots, and many stormy petrels were seen. The morning of the 27th was foggy and drizzling. We noticed a marked diminution in the number of Cape pigeons. The 28th and 29th were beautiful days, and the 30th was so warm that we were fain to don lighter clothing than that which we had been accustomed to for many months. One solitary Cape pigeon accompanied us as we steamed on our way,—finding at noon that we were only a hundred and sixteen miles from our destination. Next morning, between five and six A.M., we reached the glorious harbour of Rio, just as the day was breaking, the various striking peaks at the entrance being projected against a pale orange sky. Standing on the bridge, it was curious to observe how, as the light increased, various striking features of the landscape became gradually developed, the forms of the various trees on the wooded hill-sides unfolding themselves, and the palms which crowned many of the ridges becoming very early recognisable. Soon after we anchored we received a

large supply of letters and papers, which occupied us so fully that but few of our number went on shore that day, the majority contenting themselves with gazing on the wonderful scene around, which never lost its charm. The whole landscape appeared as if simmering in the heat, and the surface of the calm blue water, dotted with vessels of all nations, was only disturbed by the oars of some passing boat, or the splash produced by the brown gannets as they dived after their prey. These birds were very plentiful, and might be observed fishing in numbers together, particularly in the morning and evening; while frigate-birds (*Tachypetes*) were, in addition, to be seen soaring high in the air, and now and then closing and opening their deeply-forked tails.

On the following day (2d), we proceeded up the harbour to the coaling island. In weighing anchor a fine species of *Comatula* came up on the cable, and was consigned to spirits. A party of four of us landed soon after breakfast, and occupied the day in roaming over the country in the neighbourhood of Nictheroy. At the spot where we stepped on shore the ebbing tide had left a few feet of rock uncovered, and on this space a species of *Padina* was growing in profusion, and one or two specimens of a Gasteropod with a rather handsome shell, the *Turbinella Brasiliana*, were obtained. Despite the difference of the season of the year, we remarked very little change in the general aspect of the vegetation, from what it presented on our first visit in 1866, only a very few of the trees having shed their foliage, and many of the flowers previously observed being now in bloom. Among those trees which chiefly arrested the eye, were the palms, the bananas, and the mangoes (*Mangifera indica*), the thickly leaved spreading branches of the last casting a deep shadow on the ground. In the gardens various beautiful plants

were cultivated, including a Euphorbiaceous shrub, with a whorl of five or six bracts about three inches long, and of a vivid scarlet or crimson colour, subtending the yellowish flowers, a species of a *Plumieria* noticed on our former visit, but now almost out of bloom, and a creeper with a light blue corolla about an inch in diameter, and which covered trellis-work, together with a variety of brilliant-flowered *Malvaceæ*. On the hill-sides the commonest plants were species of Compositæ, including a small *Zinnia* and an *Ageratum;* and a pretty orange-coloured fungus, of the genus *Polyporus*, was abundant on dead twigs. I also found some pods of a Leguminous plant, from six to seven inches long by an inch broad. One of the first places visited was a sort of waste garden, partially surrounded by hedges, in which a species of *Lantana* predominated, my companions, who were zealous butterfly-hunters, being attracted by the variety of gorgeous insects flitting about the flowers ; but as we were loudly vociferated at by the proprietor, and a female myrmidon, we thought it advisable to evacuate the premises. Towards the close of the afternoon, after a considerable amount of time occupied at an orange stall, we returned to the neighbourhood of the landing-place, and awaited the arrival of our boat, listening to the cicadas and other insects, which, wakening up at sunset, filled the air with their notes. A small species of *Hippocampus* (*H. guttulatus*) was caught on this day, by one of the officers who had remained on board.

On the 3d I crossed over to the city (San Sebastian), with one of the officers, in a ferry-boat, and we spent some hours walking about the streets, and visiting the public garden and market. The former of these, which I have shortly described on our former visit, became a favourite resort to us when we had a spare hour to fill up, one of the great objects of in-

terest being a cow-fish or manatee (*Manatus australis*), which had been added to the collection of live animals since our last visit. This curious creature, one of the few members of the order *Sirenia*, or herbivorous Cetacea as they were at one time denominated, is common on the coasts, and near the mouths of rivers, in tropical America, and feeds on herbage and aquatic weeds. Usually the specimen in the garden at Rio was only to be recognised as a dark shadow, moving along beneath the surface of the water ; and it evinced a curious predilection for the society of a white swan, following it about in the most assiduous manner, so that the position of the bird often served as an index to that of the mammal. Several times I saw the manatee take a bunch of grass from the hand of the bystander, raising its curious fringed lips above the surface of the water to receive it, and once or twice I watched it feeding on the grass growing at the edge of the strip of water which it inhabited. This it accomplished by supporting itself, by means of one of its pectoral fins, on the top of the narrow stone ledge which bounded the water, so as to reach out its head, and then moving slowly along in a side-long manner, so as to devour large mouthfuls of the herbage. The snout is very blunt, the eyes are very small, and the prevailing tint is a dull leaden hue, varied with some lighter spots on the belly.

The market was also a considerable source of interest to us, as it usually contained a great variety of fruits, vegetables, and fish, together with birds of many kinds in cages, as well as monkeys of various sorts, including specimens of the beautiful little marmosets. Peccaries were also sometimes to be seen, and on one occasion I saw one led by a string through the streets of Rio.

On the 4th I remained on board all day, but some of the

officers landed on a small island near the coaling station, and brought me off some Molluscs and Crustacea, the latter including representatives of three genera—*Lupa* (*L. rubra*), *Goniograpsus* (*G. innotatus*), and *Sesarma* (*S. angustipes*). In the afternoon we moved down to our anchorage near the island of Villegagnon, where we remained during the rest of our stay.

In order to avoid prolixity and repetition, I shall not attempt to give a record of our daily proceedings while at Rio, but content myself with the mention of certain of those observations and occurrences which appear to me to possess the greatest degree of general interest. On the 10th several of us landed after breakfast, and under the guidance of one of the officers of the "Spiteful," had a delightful long walk, which, new to us at the time, afterwards became a very familiar beat, being generally known by the English officers of the ships in the harbour under the name of the "tank road," in consequence of its lying alongside a covered aqueduct, which, originating in some large tanks about half-way up the Corcovado mountain, conducts a supply of delicious, pure, cold water to the city of Rio. The road winds along a wooded hill, is for the greater part agreeably shaded, and commands an extensive series of views, of the finest description, of the neighbouring hills and valleys, and the harbour with its numerous islands. Close to the road, palms, bananas, *Cecropiæ*, *Bombaxes*, with trunks armed with strong prickles, and *Mimosas*, the exquisitely delicate foliage of which appears most strikingly beautiful as seen against the blue, cloudless sky, occur in abundance; and there is in addition a profusion of fine shrubs and herbaceous plants. On the walls of the aqueduct a pretty little *Begonia*, with white flowers and bright green leaves, and an *Adiantum*, with

delicate green fronds with black hair-like midribs, as well as a variety of mosses and lichens of various hues, embracing green, orange, and crimson, were conspicuous ; and the banks were covered in many spots with the pretty yellow-flowered *Thunbergia*, and a scarlet-blossomed Convolvulaceous creeper. A yellow and a purple *Oxalis* were common, as was also a curious plant of the order *Crassulaceæ*, the *Bryophyllum calycinum*,* which has the power of developing rootlets and leaf-buds from the indentations of its fleshy leaves, and will even continue to grow between sheets of drying-paper. One shrub specially attracted our attention, from the brilliant azure blue tint of its berries ; and the variety of form assumed by the ferns was marvellous, the small fronds of some species clothing the stems of the trees after the manner of ivy, while one (a *Lygodium*) was a regular twiner, winding itself in coils around the bushes. On damp rocks close to the tanks we noticed a *Begonia*, with white-spotted dark green leaves ; and some elegant *Selaginellas* were also met with. Several beautiful little humming-birds were seen hovering over the flowers, and occasionally lighting on the branches of the trees, while multitudes of lizards basked in the sun on the walls, or rustled through the grass close to our feet, but were very difficult to obtain uninjured, as they ran with great agility, and snapped off their tails without the slightest warning. A beautiful little tree-frog (*Hyla albomarginata*) was caught sitting on one of the leaves of an *Agave*. It was of an emerald-green colour above, with the feet pale yellow, and the sucking-discs tinged with vermilion. Insects of many sorts also abounded, and a variety of beautiful, though well-known forms of Lepidoptera, were captured.

* This is a naturalised, not an indigenous plant, being an inhabitant of the Old World.

The *Ageronia feronia*, already noticed as possessing the curious property of producing a crackling noise with its wings when it flies, was observed in numbers, resting with expanded wings, head downwards, on the trunks of the trees; and we often subsequently remarked it as a curious circumstance, that there was one individual tree, a species of Mimosa, from the bark of which a clear brown gum exuded, on which we were almost certain to find specimens of this insect resting.

On the 13th, having received an invitation from a Scotch gentleman, Dr. R. H. Gunning (well known for his exceeding kindness and hospitality to almost all naval officers who have visited Rio), to spend a few days with him at his estate on the Serra de Mar, about 1400 feet above the level of the sea, and fifty miles distant from the city of Rio, on the line of the Dom Pedro Railway, I landed in the morning, and drove to the Estrado Ferro at Campo Sta. Anna in the back part of the town. Here I met the Doctor, and we took out our tickets for the Rodeio station, about two miles from his house, the fare (1st class) being between five and six millereis, equivalent to about ten or eleven shillings. We started about twelve o'clock in a train of moderate length, drawn by a wood-burning engine, with a short, wide-mouthed funnel. The line passes at first through comparatively low-lying country, abounding in plantations of maize, sugar-cane, and oranges, the glossy green leaves and golden fruit of which communicated an exceedingly pretty effect to the landscape. A thinly wooded marshy tract of ground was then traversed, and here I was greatly delighted by the beauty of the flowers, and felt much tantalised by being unable to stop to gather them. I noticed, among others, some water plants, with bright blue flowers, probably *Pontederiæ*, as well as a variety of epiphytes of various orders on the trees and shrubs, some of the latter of

which possessed large white and lilac blossoms. On reaching the foot of the Serra de Mar, the train stopped for about five minutes at the station at Belem, which is only about eighty feet above the level of the sea, to allow the passengers to obtain refreshments (excellent coffee and a variety of eatables and drinkables being procurable), and then commenced the ascent, which is extremely steep, averaging one in fifty feet, and in some places considerably exceeding this. The line here pursues an extraordinarily serpentine course along the side of the range of hills, winding to such an extent that at one point six miles have to be traversed to make a mile and a half good, while some of the curves are so sharp as to permit of a stone being thrown from one side of the arc described to the other. The Serra being densely covered with virgin forest, the scenery on either side of this portion of the track is of the most splendid description. After passing through three tunnels, we arrived opposite Dr. Gunning's house; and, in accordance with a convenient arrangement entered into by the Doctor with the directors of the railway company, we were set down on a small wooden platform at the side of the line, without being carried on to Rodeio, and five minutes' walk sufficed us to reach the house, which is charmingly situated on the crest of the Serra, overlooking a deep densely-wooded valley, and recalled to me a Swiss châlet in its general appearance. Arrived in the veranda in front, the full glory of the magnificent view breaks on the visitor—range after range of hills and of intervening valleys, alike covered with dense wood, stretching away for miles as far as the eye can reach; the nearer ones exhibiting an infinite variety of shades of verdure, from the snow-white leaves of some trees to the dark glossy green foliage of others, while the more distant, of a deep blue tint, terminate in a long

range of jagged peaks on the horizon. Here and there a silver thread of water may be seen trickling down into the valleys, and a gap in the Serra discloses a fine glimpse of the low-lying country to the south of Rio, with the buildings of the Emperor's farm gleaming white in the sunlight, and beyond all, the unruffled bosom of the ocean.

The garden-plots were stocked with a variety of beautiful flowers, many of them Brazilian, and others among our most familiar favourites at home. Thus there were handsome yellow *Bignoniæ*, and a variety of *Arads*, *Euphorbiaceæ*, and *Solanaceæ*, associated with roses and fine plants of double daisies from Edinburgh. Among the domestic animals were a splendid black and white Newfoundland, and a large bay Spanish bull-dog, a fine blue and yellow macaw, and a number of pigeons, guinea-fowls, ducks, etc. After dinner, when I tasted for the first time a number of excellent Brazilian vegetables, including "mandioca" (the roots of the *Manihot utilissima*, and an admirable substitute for potatoes, whether in the boiled, roasted, or fried condition), the boiled fruit of the *Carica*, a green herb somewhat like spinach, called "ora pro nobis" by the Portuguese, and the national dish of Fejjaõs e Farinha (a kind of bean and flour of Indian corn), I set out on a stroll with my host, enjoying greatly the deliciously cool and fresh air, which afforded an agreeable contrast to the hothouse-like atmosphere of the neighbourhood of Rio. Passing through a tunnel near the house, we visited the scene of a recent land-slip, finding a gang of negro labourers engaged in wheeling away the loads of debris. Land-slips, I was informed, are very common on the Serra after heavy rains, and often occur on a large scale. This one had carried away several small houses bodily, besides mow-

ing down a number of large trees as if they had been so many straws. After walking along the top of a steep bank, on which many coffee-bushes in different stages of fruit were growing, we penetrated a little way into one of the woods, following a narrow path which ran alongside a small stream, in which were many small frogs. On the margin of this rill a very pretty pink-flowered *Begonia*, and a variety of other plants, were common. Among the bushes near the entrance of the wood a little yellow finch, much like a canary in general appearance, was hopping out in numbers; and another small bird, resembling a sparrow, was also abundant. Two parrots flew screaming through the air over our heads, and we saw an exquisite little green humming-bird sucking the flowers of a tall composite plant. In the woods the luxuriance of the vegetation was very wonderful. I was much struck by the great height, as compared with the slenderness, of many of the trees, not a few towering up for thirty or forty feet before giving off a single branch, as well as by the variety of remarkable forms presented to our gaze, including palms of several species; *Caricas*, with their characteristic scarred stems, large deeply-lobed leaves, and oblong yellow fruits; *Cecropias; Tree-ferns*, with tiaras of delicate green minutely cut fronds; and gigantic *Leguminosæ*. A huge tree, apparently belonging to the last order, which grew in a hollow in the neighbourhood of the house, presented a most extraordinary appearance: the stem, dividing at a distance of about ten or twelve feet from the ground into immense vertical folds which extended outwards and downwards on every side, subdividing in such a manner as to form a number of sloping walls from six to eight feet high, though but little more than two or three inches thick, with interspaces between

them large enough to contain several persons standing upright, and yet entirely concealed from view.*

The evening of this day, in common with those during the rest of my stay, was spent most agreeably, sitting in the veranda in the moonlight, drinking in the beauty of the scene around, while all night long a loud ringing tremulous sound was maintained, without intermission, by a multitude of tree-frogs, cicadas, crickets, and grasshoppers. The variety of notes emitted by the tree-frogs is very remarkable, ranging from a sort of chirping, like that of a bird, to a sound like that of hammering. They are very often "*vox et præterea nihil*," however, and I succeeded in capturing but few specimens of the family. Next day I had a long and beautiful ride on mule-back, winding through wooded valleys and along the sides of forest-clad hills. The creepers and lianas, or ropelike twiners, in the woods, were amazing to behold—the latter varying in thickness from the diameter of a stout string to that of a thick cable, and hanging down fifty, sixty, or even a greater number of feet, in loops and festoons from the tops of the trees. The epiphytes, or parasitic plants, were also very noteworthy. They principally consisted of Orchids and *Bromeliaceæ* (many of the latter of which displayed, high up among the tree-tops, fine spikes of rose-coloured flowers), together with an infinite variety of ferns. Many of the stems of the trees were also covered with creeping *Araceæ*, with deeply-lobed leaves, and many other plants too numerous to mention. In open spaces at the sides of the roads, several handsome species of *Solanum*, with formidable prickly leaves, were common, together with a leafless composite plant, with sessile flowers and a tri-winged stem, and curious arborescent

* A similar stem has been figured by Martius. Cf. Lindley, *Veg. King.*, p. 551.

Lycopodiums; while hedges were formed in some places of a handsome tall *Alpinia.* The small groves of bananas and the orange plantations presented a most attractive appearance, the long fronds of the former assuming most elegant curves as a slight breeze stirred them now and then. As we rode along, Dr. Gunning gave me much information about the country and its inhabitants. Human life, from his account, appears to be regarded as of but little value among the Brazilians, and murdering each other seems to be the short and easy method adopted among neighbours for the solution of difficulties in their business transactions. One man, armed with a formidable knife and a short double-barrelled carabine, whom we met on the road and exchanged polite salutations with, had, I was told, caused the death of one or two people; and another individual had acquired the soubriquet of "Mata-gente," from the number of murders committed at his instigation. In reply to my natural inquiry as to how such persons contrived to escape the penalty due to their crimes, I was informed that justice was easily evaded by a little judicious bribery.

On the 15th I took a walk through the woods, accompanied by the Newfoundland dog earlier mentioned, and armed with a kind of bill-hook wherewith to clear my way through the twiners which stretched across the narrow paths. Soon after setting out I descended the side of a steep hill-side, covered with shrubs and herbaceous plants, to a beautiful little stream, arched over by great ferns of various species, and the gigantic sagittate leaves (above two feet long by a foot broad) of an Araceous plant; and having crossed it, found my way into a narrow footpath running along near the edge of a wood on an opposite hill. Here I saw a toucan for the first time, some flocks of anis (*Crotophaga*), and several beautiful humming-birds, and I also procured a number of fine

ferns. As the way was much overgrown I made abundant use of my bill-hook ; after a time striking out into a road which commanded a view of a cascade descending into the valley below. Two days later I had an opportunity of examining two species of opossum which had been caught by the negroes. These, respectively denominated "Gumba" and "Quica" by these people, were the *Didelphys Azaræ* and the *D. Quica.* The former, much the larger of the two, covered with long coarse black and white hair, also occurs in Paraguay, where its habits have been recorded by Azara ; while the latter, clothed with soft grayish hair, is, I believe, limited to Guyana and Brazil. I passed some time on the forenoon of the 19th in watching the operations of a large army of ants which were engaged in carrying along great cockroaches to their holes, dismembering them at the entrance, so as to introduce them more easily. These, I believe, were a species of *Eciton,* and included two classes of workers—one of a black colour, with moderate-sized heads, and the other of a pale-brown hue, with great heads, armed with enormous jaws. Mr. Bates, in his delightful *Naturalist on the Amazons,* to which I may refer the reader for detailed information on the economy of these animals, remarks that "the peculiar feature in the habits of the *Eciton* genus is their hunting for prey in regular bodies or armies ;" and that it is "this which chiefly distinguishes them from the genus of common red stinging-ants, several species of which inhabit England, whose habit is to search for food in the usual irregular manner."

I brought this very pleasant visit to a close on the afternoon of the same day, returning to Rio, where I learned that the "Galatea," with H.R.H. the Duke of Edinburgh, had arrived, and was *the* topic of conversation. A few days later a ball was given in honour of the Prince by the British mer-

chants of Rio, at which a number of celebrities, including the Emperor and Empress of Brazil, and the Comte d'Eu, were present—the great sensation of the evening to the Brazilians being the advent of the Prince's Highland piper, in national costume, blowing on his instrument, the sounds produced being styled "Musica Bretanica," by those who crowded around the performer.

On the 23d one of the officers, who had been on shore engaged in butterfly-hunting, brought on board with him a live snake, which he had caught and tied up in his net. This was a specimen of the coral-snake (*Elaps corallinus*), regarded as very venomous by the Brazilians, a beautiful creature, banded transversely with crimson and black, and with the ventral scuta vermilion in colour. On the net being opened, I secured it by catching it by the neck with a pair of forceps, and then dropping it into a jar of spirits. On the 29th I landed in the morning with a companion, and had a long and interesting walk, following the road leading up to the tanks for three or four miles, and then striking into a path leading over a thickly-wooded hill lying behind the Corcovado mountain, and separated from it by a deep valley, and for some distance running parallel with an aqueduct which feeds the tanks from which the aqueduct supplying the town arises. The walk was most agreeably shaded, and the variety of the foliage wonderful. Several remarkable trees attracted my attention, to two of which I shall alone refer,—one, I believe, a kind of fig, which supports itself by wrapping its branches around another tree, till it kills its victim in its tight embrace, when both, as a rule, come to the ground together; and the other, a giant of the forest, the *Couratari Estrellensis*, or an allied species. The stem of this magnificent tree frequently attains a height of from seventy

to a hundred feet, before detaching a single branch, and its boughs, which ramify in a peculiar manner, are almost invariably bristling with epiphytes of various orders, which occur frequently in such masses as almost to conceal the proper foliage. Some beautiful flowers, and a large number of ferns, including representatives of the genera *Polypodium*, *Doryopteris*, *Gleichenia*, *Anemia*, *Lygodium*, *Lomaria*, *Hymenophyllum*, etc. etc., were obtained on this occasion, and I captured a rather large spider of the genus *Mygale*, and found two specimens of a land-shell of the genus *Bulimus* (*B. Taunaisii*), about two inches and a half long. Travellers have sometimes expressed a feeling of disappointment in the tropics, somewhat analogous to the exclamation of the Princess in Landor's Gebir, "Is this the mighty ocean,—is this all?" but for my own part I can truly say that the scenery of Rio de Janeiro fully surpassed my highest expectations, and never palled upon me. I often realised, on the contrary, that such an amount of beauty was crowded into a comparatively limited area, as was almost impossible fully to appreciate.

On the afternoon of the 3d of August, while walking along the tank-road, I witnessed a very curious spectacle. A large dark-coloured wasp, a little over an inch long, was flying off with a green grasshopper, fully twice its own size. It appeared to find its burden rather unmanageable, as it took very short flights, resting at intervals. I endeavoured to secure both captor and victim, but only succeeded in obtaining the latter, which was not quite dead. On the 8th several of us landed, and went by steamer to Botafogo, from whence we walked to the Botanical Gardens, which were in a more tidy condition than when we visited them in the previous year. On the trees we found several specimens of a land-shell, the *Bulimus auris muris*, and we made a vain

attempt to capture a dark-green lizard, with a very bright orange throat, and a long slender tail, which was running up the stem of a tree. That evening the sunset was even finer than usual, the whole sky around Rio being one scarlet glare, against which the church spires of the town, and the various fantastic forms of the mountain-peaks, stood out in dark relief. On the 16th I walked up to the summit of the Corcovado, an elevation of nearly 2300 feet, which commands a wonderful view of the harbour of Rio, Botafogo, and the Botanical Garden with its avenue of cabbage-palms, which, viewed from above, presents a very curious formal appearance; and three days later I had a pleasant excursion with four companions to Tijuca, a valley about 700 feet above the level of the sea, about eight or ten miles distant from Rio, and a great resort for English residents there as furnishing a salutary change of air. Taking our places on the top of a 'bus drawn by mules, which started about noon from a square in the city which forms the general rendezvous for public conveyances, we had a prolonged and rather weary, though somewhat amusing, journey, owing to the excessive stubbornness of the quadrupeds, which meandered from side to side along the road, and could with extreme difficulty be urged beyond a walk as far as Anderahy, a village at the foot of a steep hill, which requires to be surmounted before descending into the Tijuca valley. The summit of this hill, up which we walked, is well named Boa Vista, as it commands a fine view of the flat tract of country extending between Rio and Anderahy; and in its neighbourhood, on the way to Tijuca Peak, is a beautiful cascade, well known as "the little cascade" ("Cascada pequena") of Tijuca, to all who are acquainted with the neighbourhood. Following a gradual descent from Boa Vista, we arrived in course of time at the well-known

Bennet Hotel in the Tijuca valley, where we put up during our visit. On the afternoon of the same day we walked down through a valley stretching from Tijuca to the low-lying country near the sea, outside the harbour of Rio, and which commands a grand view of the curious anvil-shaped peak of La Gavia, or Lord Hood's Nose of seamen. Through a gorge in this valley a stream of considerable size runs, forming several fine cascades ; and close to its track lie a number of gigantic boulders, heaped together in the most wonderful manner. So great is the size of some, that cottages in their vicinity appear dwarfed when compared with them, and the broad flat top of one has been utilised for drying coffee upon, a low wall being built round the edges. A most curious effect was produced, as may be well imagined, by the sight of a man walking about on the top of this great stone, and raking out his coffee. Many of these boulders were clothed with a vegetation of Agaves, Cacti, Orchids, *Bromeliaceæ*, and climbing Arads ; and in the cavities left beneath them, where they were piled upon one another, various strange lianas depended. The sides of most were so steep and smooth as to render their ascent impossible, but we contrived to get to the top of one on which various small shrubs and trees were growing. Many fine ferns of various genera were met with on this occasion, and we refreshed ourselves with much satisfaction with the oranges and loquats which were growing in abundance at the sides of the road. The latter tree, *Eriobotrya Japonica*, a native of Japan, as its name implies, as well as of South China, is doubtless familiar to many of my readers, being cultivated in India and the southern parts of Europe. It bears large oblong evergreen leaves, and white flowers succeeded by pale orange, somewhat pear-shaped, fruits containing large brown seeds, and possessed of a most

agreeable sub-acid flavour, which renders them very grateful to the palate in the warm regions where they ripen. The great drawback of this day was furnished by the mosquitoes and "barrachutas," which were very numerous, and bit most savagely. The latter insect, a minute black fly, settles gravely on any exposed part of its victim, inflicting a minute puncture, to which his attention is first attracted by a minute drop of effused blood immediately beneath the cuticle, and which is shortly afterwards followed by a considerable amount of swelling and violent irritation, often lasting for two or three days. These insects, I may remark, are not common in the immediate neighbourhood of Rio, where mosquitoes abound, and their bite is far more virulent in its nature than that of these well-known pests.

The following day, while scrambling along the rocks at the side of one of the cascades, I captured a female specimen of a fresh-water crab, of a dull purplish colour, the *Trichodactylus fluviatilis*, very common in Brazil, and was surprised to find between fifty and sixty fully-developed young individuals beneath the pleon or tail-flap, in the position ordinarily occupied by the ova. These little creatures were very active, and several made their escape when their parent was taken. I was much interested by this circumstance, which apparently proves that the young of this species do not pass through any transformation, like the majority of crabs; or, if they do so, that the different phases are assumed when they are still associated with the mother. Professor Westwood, so long ago as 1835, in a very interesting memoir in the *Philosophical Transactions*, "On the supposed Existence of Metamorphosis in the Crustacea," pointed out that in certain land-crabs no metamorphosis takes place in the young; but I am not aware that the fact has been previously recorded as regards the above species.

The 21st was a very damp, cloudy day, and I found many specimens of *Bulimus auris muris* crawling about. Heavy rain came on in the afternoon, and in the evening there was a wonderful display of thunder and lightning, the whole sky being sometimes in a perfect blaze of light. I returned to Rio on the following day, and found that one of the officers had in my absence found a specimen of a curious reptile the *Cephalopeltis scutigera*, allied to an *Amphisbæna*, and resembling it in its cylindrical worm-like body, and the ringed folds of the investing skin. Some days later, a gurnard-like fish, the *Prionotus punctatus*, was taken swimming at the surface of the water, close alongside the flagship, H.M.S. "Narcissus," and sent to me by the kindness of the admiral.

On the 11th of September I accompanied Captain Mayne and a party on an excursion to the island of Paqueta, two or three miles distant from the head of the harbour. On our way thither we were much struck with the beauty of various of the small islands which we passed, which were clothed with a rich vegetation, presenting an infinite variety of shades of green; and we also noticed with interest some remarkable rocks sticking out of the water, and clothed up to high-water mark with a small species of oyster, with which the harbour abounds. We landed on a beach of shell-sand, opposite a house commanding a beautiful prospect of the chain of the Organ mountains, and in the vicinity of which a number of fine cocoa-nut palms were growing. Hanging up in the veranda of the house was the dried skin of a fish with large scales, and, on going to examine this, I found that a small bird had built its nest in the interior. We remained on the island till the evening, strolling about very agreeably. Numbers of tamarind trees were planted in various spots, and their bright

green foliage had a very pleasing effect. Over a flat space of sandy ground, termed the "Campo," many specimens of a Myrtaceous shrub, called "Pitanga" by the Brazilians, were scattered. These belonged to a species of *Eugenia*, and, like many of the other plants of the order, had pretty white flowers, which are succeeded by red ribbed fruits, somewhat resembling small tomatoes in form, and consisting of a soft fleshy pulp, enclosing hard seeds in its centre. These fruits are much esteemed by residents in Brazil, but we thought them very unpalatable, possessing a sickly sweetish taste, succeeded by a flavour of coal-tar. We inspected a small vein of copper occurring in one spot, but found it to be of very inferior quality. Lying on the beach I observed several heads of a species of hammer-headed shark, as well as numerous dead shells of bivalve Molluscs, among which the *Anomalocardia macrodon* was one of the most plentiful. I noticed a number of young Mangroves growing in the water; and on a boulder I found an *Aplysia*, of a mottled gray colour (*A. brasiliana*), which emitted a fine purple liquid when handled. One of the boat's crew also brought me some specimens of terrestrial animals, carefully wrapped up in pieces of newspaper, announcing that, among other things, there was a "tri-antelope," and thereby exciting my curiosity as to the unknown creature, which proved, when disclosed to view, to be a large spider—a *Tarantula* being, as I afterwards concluded, the animal intended. At one spot we came across two men in a fishing-boat, and were amused to observe a large live fish tethered below the bottom of the boat by means of a narrow cord, which permitted it to swim about freely. We left the island in the evening, when the fire-flies were beginning to appear in numbers, and returned home in the moonlight without any particular adventure, with the exception of

being dragged on to the top of a large boulder by our steam-cutter, which had us in tow.

A few days after this the screw of the "Nassau" was got up to be cleaned, and we then found it covered with animal organisms, consisting principally of great quantities of a Tubularian Hydrozoon, in the masses of which numbers of other animals had taken up their abode. Among the most plentiful of these were two small species of fish (a Blenny, apparently the *Blennius gentilis*, known previously from California, and a minute *Gobiesox*), and some small Molluscs and Crustacea, including thousands of a species of *Caprella*, which looped their bodies about in the peculiar restless manner so characteristic of the genus. This species, which I subsequently referred to Mr. Spence Bate for determination, was pronounced by him to be the *C. dilatata* of Dana, who likewise procured it in Rio harbour. On the 18th, while walking along the aqueduct road, my attention was attracted by the perpetual dripping of large drops of water from the leaves of a *Mimosa*, to such an extent as to render the ground beneath its shade quite damp, while the soil beneath the other trees was perfectly dry; and I often noticed the phenomenon on subsequent occasions, without ever being able to explain the cause of it. On the 24th, accompanied by two of the officers of H.M.S. "Narcissus," I went out by 'bus to Botafogo, and thence walked through a valley between the hills to the sea outside of Rio harbour. Here there was a sloping beach of fine white sand, on which the sea was breaking with a heavy surf, and which gave forth a peculiar squeaking sound when trod upon. Much amusement was afforded us as we walked along the shore by the movements of a crab, the *Ocypoda rhombea*, with a white bleached-looking body, numbers of which were reposing on the dry sand at the distance of some yards from the water,

and, on becoming alarmed at our approach, scuttled down to the sea. I do not know whether, by reason of their projecting eyes, they are more long-sighted than ordinary crabs are, or whether their auditory sense is very acute, but we were surprised to observe many of them begin to run down to the water when we were as much as twenty yards off. They raised themselves very high on their legs, and ran with such rapidity that we found it impossible to overtake them, even running at full speed, as they dashed boldly into the surf, whither we could not follow them. One, apparently less wide-awake than the others, was at last captured by our getting between it and the sea and surrounding it. This individual was consigned to a small tin vasculum, and that evening, being tired with my exertions, I went to bed without removing it from its prison. It contrived, however, to make such a racket as rendered sleep impossible, so that at last I was obliged to get up and put an end to its existence by immersing it in spirit.

On the 1st of October I crossed to the opposite side of the harbour, and walked round part of Five-fathom Bay. Near the shore, several very curious rocky pinnacles, some of which bore a scanty vegetation on their summits, rise out of the water. On the sandy beach I disturbed two black vultures feeding on the putrefying carcass of a lamb. These birds, the Gallinazo (*Cathartes atratus*), are very common about Rio, where hundreds may be seen in the neighbourhood of slaughter-houses at San Cristoval, perched on palings or the branches of trees, on the look-out for offal. They may be also observed soaring in circles at a great height in the air, with the tips of the primary feathers widely separated. Mr. Darwin remarks that he believes that this species, which has a wide distribution in the northern parts of South America, never extends to the south of the Rio Negro, in lat. 41°, and

that, on the western side of the continent, he never observed it in Chili. I obtained specimens of some fine Crustacea on this occasion, including a *Hepatus* (*H. angustatus*), a *Lupa* (*L. cribraria*), with a beautifully mottled carapace, remarkably produced on each side into a sharp spine, and the curious *Hippa emerita*, which burrows in the sand.

On the 3d, Dr. Campbell and I ascended the lower part of the Corcovado, and spent much time deeply interested in the contemplation of a number of leaf-cutting (Saüba) ants, which were marching along in armies, each individual carrying a portion of a green leaf, held in its jaws, over its back. The size of the loads carried in many instances was most surprising. I preserved at the time specimens of them; and the pinna of a leaf which was being carried by a single individual now lies before me, measuring nearly two inches and a half long, by almost half-an-inch broad! It was a most curious sight to watch the industrious little creatures cutting semicircular pieces out of large leaves which had been previously detached, and let fall to the ground, by biting through the petiole. There seemed to be two classes of labourers, each with their own special work—one set, with very large jaws, acting as sawyers, while another body, with jaws of smaller size, carried off the loads when they were cut. The rapidity with which they cut out the pieces was also most remarkable, fragments nearly an inch in size being detached in less than five minutes. Another body of these insects observed by us on another occasion, in the public gardens in the city, presented a most curious appearance, marching in single file, each carrying a fragment, from half to three-fourths of an inch long, of the leafy twigs of a *Thuja*, over its back, so as to recall the celebrated "moving wood" which came to "Dunsinane."

CHAPTER VIII.

LEAVE RIO FOR THE STRAIT—ARRIVE AT MONTE VIDEO—EXCURSION TO BUENOS AYRES—MUSEUM—ROMAN CATHOLIC PROCESSION—LEAVE MONTE VIDEO—VIOLENT PAMPERO—AMIMALS TAKEN IN TOWING-NET — FLIGHT OF MOTHS—ENTER THE STRAIT — SEA-LIONS — CHIONIS ALBA — REACH SANDY POINT — MAGELLANIC PRIMROSE—CAPE PORPESSE—BLACK-NECKED AND WHITE SWANS — CAPE NEGRO — EMBOTHRIUM COCCINEUM—EAGLE — VISIT TO SANTA MAGDALENA — PENGUINS — REMARKABLE CORMORANT-ROOKERY — SIR RICHARD HAWKINS' DESCRIPTION OF THE ISLAND—RAMBLE ON THE COAST OF GREGORY BAY—MARECA CHILOENSIS.

THE season being now sufficiently far advanced to permit of our return to the scene of our labours, the "Nassau" left the bay of Rio Janeiro on the morning of the 14th of October, to begin her southerly voyage. It was a most brilliant sunny day, and as we slowly left the narrow entrance of the harbour behind us, the view of the Sugar-loaf, Gavia, and other well-known heights, lying in mingled sunshine and shadow, with the blue cloudless sky overhead, and the white surf breaking at their feet, was singularly fine. We soon encountered a rather heavy swell, the result of rough weather on the two preceding days, but proceeded quietly onward under steam and sail, nothing specially worthy of record taking place. The following morning the screw was got up, and for the next two days we proceeded prosperously under sail, maintaining a rate of from six to eight knots, until noon

on the 17th, when the wind forsook us, and we had again recourse to steam. The afternoon of that day was beautiful, but next morning it was blowing hard, and by the afternoon a regular pampero had set in, against which we struggled painfully. The night that succeeded is vividly impressed on my memory, by the extent of its discomfort—a large earthenware jar containing a lizard (Teguexin), in methylated spirits, breaking in my cabin, so that I was almost suffocated, from the impossibility of keeping my windows wide open, as the water was coming over the bulwarks in sheets ; and (to add to the discomforts of the situation) a shower of books, not sufficiently jammed up, descending on the top of me as I lay in bed. The gale continued during most of the 19th, but gradually died down towards the evening, and on the 20th we had again delightful sunny weather, with a favourable breeze, which allowed sail to be made in the morning. On the forenoon of the 21st, we passed Maldonado, gaining a transitory view of the "Narcissus," which had preceded us from Rio some days previously. The afternoon and evening were very fine, so that, as we steamed up the Plate, we had an excellent view of the coast, which again recalled that of Holland, in many of its features. As was the case on the preceding year, great quantities of cobweb appeared on the rigging of the ship, accompanied with a considerable number of the architects. We anchored well up the harbour of Monte Video, soon after six P.M., shifting billet next morning to a more roomy berth. That day I landed shortly before noon, and after strolling through the Cathedral Square and the market beyond, without observing anything worthy of remark, pursued my way along a long straight street, planted with trees on either side, and distinguished at one extremity by a tall column, bearing on its summit a statue

of Liberty, with a sword and banner, the latter of which, hanging in folds, presented in the distance a striking resemblance to a Gampish umbrella. After a time I descended to the sea-coast, passing a tract of country on the suburbs of the town, principally distinguished for its sterility of aspect, and the evil smells arising from the dead carcasses of horses, cows, dogs, goats, and fowls, lying about in every direction, with large black pigs prowling about them. Once arrived at the beach, I found that the same destitution of animal life, remarked at the time of my last visit, prevailed, the only living creature to be met with being the small crab observed on the previous occasion. On the rocks, above high-water mark, many plants of a species of *Echinocactus*, were growing, looking at first sight like sea-urchins left by the tide; and on some grassy downs sloping towards the sea, with large masses of gray rock cropping out of the turf here and there, I found a number of other plants, including the white *Petunia* seen the year before, various yellow and white Compositæ, a beautiful rose-coloured *Oxalis*, a small passion-flower, a diminutive *Cereus*, a *Gnaphalium*, a purple *Lathyrus*, and a variety of grasses. A few large gulls were assembled on the beach, and a few specimens of a bird resembling a thrush were hopping about on the green sward.

On the 23d I accompanied Captain Mayne on a visit of a few days to Buenos Ayres, the capital of the Argentine Republic, about ninety miles up the river from Monte Video. As the scenery of the Plate presents but little of interest for the traveller, we determined on making our passage by night, and accordingly, between five and six P.M., went on board the "Rio Uruguay," a Clyde-built steamer, which shortly after started. Dinner took place about an hour later, and we then found that there were very few English people among our fellow-

passengers, and that these were disposed to give us a wide berth. Next morning we arrived at Buenos Ayres about four o'clock, anchoring in the inner roadstead; and about three hours later we left the vessel (which, on account of the shallowness of the river, owing to the extensive mud-banks, was obliged to lie at some distance from the town), in a great awkward flat-bottomed boat, which was sculled to the end of a long pier. We were rather dismayed at first at the amount of the fare demanded for our transport, forty dollars being the required sum, but were reassured by the information that, although the Monte Videan paper dollar was valued at about four shillings, that of Buenos Ayres was only worth twopence at the present time, owing to the excessive depreciation of the paper currency. After a cursory inspection of our portmanteaus by the custom-house officers, we walked to the "Universelle Maison," a very good lodging-house in the Calle San Martin, where we took rooms, afterwards proceeding under the guidance of an Englishman to the Strangers' Club in the same street, where we were duly introduced, and soon after had breakfast. This accomplished, we set forth on a tour of inspection, visiting a variety of places, including the office of the well-known *Buenos Ayrean Standard*, and the Museum, which, on account of its fine collection of the extinct tertiary Mammals of South America, I was very anxious to see. There I had the pleasure of meeting the distinguished director, Dr. Burmeister, with whom I had much interesting conversation, and who was good enough to show me some of the more interesting specimens in the Museum, including magnificent examples of the *Mylodon, Toxodon, Glyptodon*, etc., far surpassing any in the collections in England. On a second visit which I paid to the Museum on the following day, he exhibited to me various other objects of interest, such as the

rare *Chlamyphorus retusus* from Bolivia, together with the fine collection of Armadillos, which includes, among other rarities, a full-grown monstrous specimen of one species, with six legs.

Of the general arrangement of the Museum the following outline, borrowed from a description of it, furnished by Dr. Burmeister to the pages of a German periodical, may suffice. It consists of a suite of seven rooms, situated in the upper storey of an edifice, to which a staircase of thirty-two steps conducts the visitor. Of these apartments the first is devoted to the greater portion of the ornithological collection, contained in seventeen elegant cases, while the second, a hall one hundred and thirty-two feet in length by eighteen in breadth, contains, in addition to the remainder of the birds, the following objects:—On the north side the collection of recent Mammalia in eight cases; on the east side four cases of other animals; and on the west side eight cases of fossil bones. The middle of this sala is occupied principally with the following specimens:—1*st*, A large specimen of *Sphargis coriacea*, taken at the mouth of the River Plate; 2*d*, a complete specimen of a female *Mylodon gracilis*; 3*d*, the pelvis of a male of *Mylodon gracilis*, a complete fore-leg of *Megatherium*, a hind-leg of *Megatherium*, with half of the pelvis, and a femur and some vertebræ of *Mylodon giganteum*; 4*th*, a sternum of *Megatherium*; 5*th*, a carapace of a *Glyptodon*; 6*th*, the entire skeleton of the same individual; 7*th*, a skeleton of a horse. The third contains a collection of engravings; and the fourth, which serves at the same time for a workroom for the director, is occupied by the entomological collection. The sixth is the laboratory, and the seventh is employed as a storeroom. The specimens in the Museum are chiefly derived from America and the south of Europe, and Dr. Burmeister

devotes his efforts principally to making it a complete representation of the fauna of the Argentine Republic. The most valuable part of it is, undoubtedly, the collection of fossil bones; but there are some very interesting skeletons of recent Cetacea, including the *Epiodon*, described four or five years ago from a specimen taken in the Plate. In so far as I could learn, however, there appeared to be comparatively little interest taken in the collections by the Argentines; and Sunday, I believe, is the principal day on which the Museum is open to the general public.

Buenos Ayres, it is almost needless to remark, is a very large city, and, like most other South American towns, inhabited by a Spanish-speaking community, is constructed with great regularity, the houses forming hollow squares, with courtyards in the centre, and being arranged in quadras, so that nearly all the streets intersect one another rectangularly. At one time most of the houses were only one storey in height, but now, except in the outskirts, the generality are provided with two or three. Germans and English form a considerable item of the population, and it was readily to be observed to what a much greater degree these languages were to be heard spoken in the streets than in those of Monte Video. It would be unpardonable were I not to refer to the exceeding kindness and hospitality which we received during our short stay from various of the English residents; and among these I may be permitted specially to mention Mr. Smith, the clergyman of the Presbyterian church, who is held in great and deserved respect by the general community.

On Sunday the 27th I witnessed a great Roman Catholic ceremony, that of Corpus Christi, as I was informed, which had been delayed beyond its usual time on account of the state of the weather. At the close of morning service in the

Presbyterian church that day, I walked rapidly down to the Cathedral, the front of which occupies a considerable part of one side of a large square. On my way I noticed that the ground in many of the streets was strewn with a plant smelling strongly of anise, and other herbs, while various gaudy shrines, lighted with numerous candles—which, on this sunny afternoon, diffused a sickly yellow glare—were erected at the corners of the streets; and the balconies of the houses, draped with silk and damask curtains of various colours, were filled with gaily-dressed ladies holding baskets and trays of flowers. When I entered the cathedral, the archbishop was just in the process of doffing his mitre, and in a few minutes after a long procession was formed in the centre of the building, and proceeded slowly to move towards the principal entrance, to the music of the organ, together with that of a number of peripatetic performers provided with fiddles and flutes, with a negro at their head, who jangled a bell with great vigour; a vast expenditure of incense going on at the same time. After the musicians came an assemblage of laymen carrying immense lighted wax candelabra, and behind them a collection of very ill-favoured looking priests, who were in their turn succeeded by a number of youths in white dresses; while in the rear of all marched the archbishop in a gorgeous dress, carrying the host, beneath a canopy supported on silver staves borne by a collection of individuals attired in a costume resembling that of a parish beadle. On issuing from the cathedral, the procession halted for a few minutes in the square in front, where a regiment of soldiers in gray uniforms was drawn up, and an immense crowd of people was assembled, and then moved slowly onwards, the soldiers falling in behind and marching to the music of a military band. As this extensive company defiled through the streets, showers of the petals of roses and other

flowers were poured down upon the functionaries from the balconies and windows in such profusion, as in the distance to resemble a pink snow-storm. On arriving at the shrines a bell was jangled vehemently, and the members of the procession then all went down on their knees in the street, while the old archbishop waved a censer about, and the corps of priests chanted in a dolorous manner. This went on for a few minutes, till a great cross, carried near the head of the procession, was elevated, when the bells in all the churches clanged, as if seized with paroxysms of fury, and the people arose and marched on to the next shrine, where the same ceremony again took place. After a detour through the streets they returned to the cathedral, where the host was replaced in its niche with great demonstrations of reverence, after which the archbishop changed his robes, assuming a great crimson mantle which trailed for yards behind him, supported by a youth, who, to facilitate the operation, wound some folds of it around his shoulders.

We had very fine weather during the time of our stay at Buenos Ayres, with the exception of a tremendous hail-shower one evening, which, though it lasted for only a very short time, flooded the streets; and, the short time at our disposal being at length expended, we took our places in the "Rio Uruguay" again about five o'clock on the afternoon of the 28th. Soon after we started there was a magnificent display of thunder and lightning, and thereafter it began to blow hard, so that we had a very rough passage down the river, being obliged to lie-to for some time in the course of the night, owing to the thickness of the fog, so that we did not reach Monte Video till eight A.M. on the 29th. Next day it was blowing sufficiently hard in the morning to make landing unpleasant; but in the afternoon a few of us went on shore for a stroll, and I

then had the pleasure of meeting Mr. Lettsom, H.B.M. Consul, a gentleman well known for his extensive acquaintance with science, who showed me many interesting specimens of minerals from various parts of Banda Oriental. On the afternoon of the 3d we weighed, and steamed slowly out to the outer roadstead, where H.M.S. "Narcissus" was lying, anchoring there for the night, and early next morning taking our departure for the Strait. The day was bright and sunny, and the air fresh and cool; and towards afternoon, as there was a favourable breeze, and it was always our object to save as much coal as might be, with which to carry on our operations on the surveying ground, the screw was got up, and we proceeded under sail. This comfortable state of things was not, however, destined to last long, for heavy rain came on in the evening, and the breeze thereafter died away in great measure, so that we made comparatively little progress during the night, and by the morning of the 2d it was dead calm. Soon after, a breeze set in right in our teeth, causing the vessel to go through a series of pitching and corkscrewing motions of a very unpleasant nature. It rapidly freshened to a violent gale, and throughout the ensuing night blew with increased fury.

On the 4th, in the morning watch, a heavy sea, striking the vessel, carried in fifty-six feet of the upper part of her starboard bulwarks, causing her to present a rather forlorn appearance to my gaze when I came on deck. It continued to blow with great vehemence during the earlier part of the day, when we went along, if indeed we could be truly said to progress, under reefed fore-topsail and fore-trysail, Cape pigeons and stormy petrels flying around us in numbers, while several albatrosses skimmed over the billows at a little distance. Towards evening, however, the wind and sea

went down, and by the morning of the 5th there was little wind, but a very heavy swell, which exhibited the capability, largely possessed by the "Nassau," for extensive rolling. By the evening it had become nearly calm, and we took advantage of this circumstance to put over the towing-net. Two hours later, when it was hauled in, I found in it a minute *Velella,* and two specimens of an Amphipod of the family *Hyperidæ*—the *Themisto antarctica.* Next morning, 6th, it was dead calm, the sun shining brightly, and the surface of the water like oil in smoothness. On hauling in the towing-net, at eight A.M., we found in it multitudes of the Amphipod obtained on the previous evening, a few specimens of *Ianthina exigua,* and some exquisite Acalephæ, the majority of which were species of *Ctenophora.* Several of these were *Beroes* of various forms, some colourless, and others with ctenophores of a beautiful rosy tint. The motion of the ciliated plates was splendidly seen in these, as well as in a large species of the same order, with regard to the genus of which I felt doubtful, as it was much injured. When entire, it must have measured at least six inches in circumference. It was transparent, with innumerable delicate reticulations of crimson-lake, and waves of iridescence passed along the ctenophores when the plates were in motion. The oceanic Hydrozoa were also represented by a lovely little species of *Physsophora* which I sketched from life. In general form it bore a close resemblance to the *P. disticha* of Lesson, but the necto-calyces had not such a distinctly two-rowed arrangement. The hydrocysts, which surrounded a large number of tentacula varying considerably in form, were transparent, tinged with pale purple, with a yellow, opaque, cream-coloured line running down the centre, and several were slightly tinged with yellow at the tip. They were firm to the touch, and were

frequently twisted, and contracted rapidly while the animal was alive. Some hours later, a few specimens of *Idotea annulata*, an Isopod obtained on the previous year to the north of Rio, were obtained; but thereafter, a fresh breeze springing up, we went on our way too rapidly to permit of further use of the towing-net at this time.

The 7th was a beautiful bright day, with a fine rolling blue sea, and we made good way, keeping up a pretty steady average of about seven knots. Several specimens of *Fulmarus glacialioides* were seen, and about an hour after noon, when we were about 150 miles off the nearest land, a bird allied to a starling (*Xanthornus flavus*) was noticed flying about the vessel. The sky some hours before sunset was most beautiful—pale blue, sprinkled over with multitudes of delicate cirri, across which a veil of cobweb-like lines of cloud was drawn. The breeze continued fresh during the night, and early on the morning of the 8th, but after that fell considerably. Between nine and ten A.M., when, according to our calculations, we were nearly opposite the Rio Negro, a rather large *Sphinx* and several small moths flew on board. A few hours later many more arrived, including a large moth measuring about three inches across the wings, as well as several specimens of a *Sphinx* with pink underwings, and bearing a considerable resemblance to *Deilephila Galii*, but distinct from it, and new, I am informed, to the British Museum collection. The latest visitor was a small gray and brown warbler, which remained with us for some hours feeding on the moths. The day, I may observe, at the time of the arrival of these animals, was very dull and foggy, and at noon drizzling rain set in, and continued till between five and six P.M., the weather fairly clearing up before sunset, about an hour later. The sun sank yellow beneath a great

mass of dark cloud, passing slowly over a clear space of sky close to the horizon before it dipped beneath the wave; and after its disappearance the western clouds became traversed with innumerable long lines of gold, while those in the east were suffused with a pink glow, and displayed a broad rainbow of the same colour.

We made little way during the night, but the breeze revived again next morning (9th). That day various patches of floating "kelp" were observed, and petrels and albatrosses were seen in numbers. On the 10th, on which we made little progress, as the wind had fallen very light, and there was a strong current against us, we saw some black-and-white porpoises tearing through the water, and a few animals were procured in the towing-net, including three beetles,* one of which was a fresh-water species, a few minute specimens of *Lepas australis*, attached to the air-vesicles of *Macrocystis*, and two small *Pteropods*, the *Cleodora pyramidata* and *Cuvieria columella*, both widely-distributed forms. The 11th was clear, bright, and cold, with but little wind. In the evening a Cetacean, about twelve feet long (apparently a species of *Delphinus*), appeared close astern, and followed the vessel for some time, diving about in the vicinity of the towing-net. It had a broad flat head, with a pointed nose, and sighed loudly as it appeared above the surface of the water, but did not spout. A breeze again sprang up during the night, so that by the morning of the 12th we were making from six to seven knots on our course. The three following days were not distinguished by any particular event; but the 16th was sadly marked by the death of one of the ship's company, who, after having made a partial recovery from typhoid fever con-

* At this time we were about 200 miles from the nearest land (coast of Patagonia).

tracted at Rio, had had a relapse while we were in the River Plate, and for the last few days had been evidently sinking. At four o'clock the same afternoon he was committed to his "vast and wandering grave" in the mighty deep. Later in the day, as we were nearing the Strait, we again got up steam, to endeavour to make sure of reaching it on the morrow.

At about 3 P.M. on the 17th, a fine but very cold day, Cape Virgins was sighted, much to our satisfaction, as there was an almost unanimous feeling of pleasure in the return to the field of our labours. The first living creatures seen outside the Strait were a cormorant and a penguin (*Spheniscus Magellanicus*); and as we entered it and approached Dungeness Spit, a most remarkable spectacle was furnished by a herd of between fifty and sixty sea-lions assembled on the shelving beach. It was curious to watch the huge unwieldy monsters rearing up their heads, and plunging down the shelving beach to the water, where they splashed about. A great flock of cormorants was also seated erect on the spit; and soon after some one pointed out several so-called "pigeons" flying about not far from us. These, which it was certainly very pardonable to mistake for pigeons, from their resemblance in flight and colouring, I immediately recognised as the sheathbill (*Chionis alba*), which we did not meet with on the previous season. This interesting bird forms one of two species of a genus, regarding the true position of which in the ornithological system considerable difference of opinion has been entertained by ornithologists—some placing it among the *Gallinæ*, while others, and I think with more reason, are disposed to regard it as belonging to the *Grallæ*, and allied to *Hæmatopus*. The above species, which derives its English name from the peculiar form of the upper mandible, was first described by Forster, and is mentioned in Cook's *Voyage*

towards the South Pole in 1772-75, as having been found at Staten Land. Cook remarks very truly that the bird "is about the size of a pigeon, and as white as milk," and mentions that it has a very disagreeable smell, a circumstance also commented on by Mr. Darwin, but which I did not notice in the two specimens which I had an opportunity of examining. The legs are long, of a blackish-gray colour, and bear a considerable resemblance to those of an oyster-catcher (*Hæmatopus*). They feed on molluscs and other marine animals, and are often to be seen far out at sea to the south of Cape Horn. In the Strait of Magellan, however, they do not appear to be common, as I only noticed them on one or two occasions.

We anchored under Dungeness that evening, and I, in common with several of our number, entertained designs of landing on the Spit early next morning, to engage in a campaign against the sea-lions, but rain and wind set in immediately before the time we intended to land, and we were thus frustrated in our project. We weighed between eight and nine A.M. (18th), and moved on to Gregory Bay, where we remained for the night ; and I obtained a *Boltenia* and several examples of the large *Cynthia* I have mentioned as procured on the previous season, in the dredge. We left our anchorage at two A.M. on the 19th, and proceeded onwards to Sandy Point, which we reached about six hours later. On landing after breakfast, we found a large budget of letters and papers awaiting us, but learned, much to our disappointment, that a vessel, the Pacific Steam Navigation Company's ship "Peru," which we had expected to meet and despatch a mail by, had made a shorter passage to the Strait than we had calculated upon, and passed through two or three days before. It was a lovely spring morning when we got on shore, and the

woods behind and on either side of the settlement were looking extremely pretty, the foliage of the Antarctic beech being in its first freshness. On the low sandy ground close to the beach the little *Berberis empetrifolia* covered many spots with its prostrate stems, thickly laden with yellow blossoms, which diffused a pleasant, faint perfume; and a number of other plants were in full flower, some noticed on our first arrival in the preceding year, and others which, owing to the more advanced state of the season at that time, had then passed out of bloom. Among the latter was the beautiful Magellanic variety of our British *Primula farinosa*, at one time regarded as a distinct form on account of its white flowers, but, as I found on this occasion, occurring in equal abundance with purple ones, and a Saxifrage (*S. exarata*), resembling *S. tridactylites* in general aspect. Other plants found profusely in flower were the Magellanic currant, a shrubby Composite of the genus *Baccharis*, a yellow *Ranunculus*, and the *Anemone decapetala*.* A number of birds were observed on this occasion, including the *Turdus Falklandicus*, which sang most sweetly during occasional showers, *Anæretes parulus*, the Bandurria, and numerous oyster-catchers, gulls, cormorants, and steamer-ducks.

Next day I walked for some distance over the "Bandurria Plains," finding, among other objects, a nest of *Centrites niger*, containing several white eggs, marked with purplish-brown spots, and some good flowering specimens of *Oxalis ennea-*

* One rather curious plant that I have omitted to mention as extremely common about the settlement, and which exists in more or less abundance throughout the wooded country of the Strait, as well as at the Falkland Islands, is the *Gunnera* (*Misandra*) *Magellanica*, a dicœcious apetalous herb, with creeping stems, orbicular-reniform leaves, supported on rather long petioles, and small round scarlet fruits, about the size of a sweet pea, closely agglomerated together into a sort of spike.

phylla. The flowers were of a delicate pinkish-purple colour ; and it is a fact worthy of note that, while all the specimens of the plant observed by me in the Falkland Islands possessed flowers of a snow-white tint, all those collected in various parts of Patagonia had flowers more or less tinged with various shades of purple. On the 21st, in the course of a long walk to the south of the settlement, I found *Hippuris* growing in abundance in pools of brackish water close to the beach, and obtained some splendid flowering specimens of *Berberis ilicifolia* in the woods. On the following morning I landed with Captain Mayne and one or two of the officers, with the intention of riding up to the coal-mine ; but the governor assured us that the river was too much swollen from recent rains to permit of the attempt, and we accordingly rode out instead over the plains as far as the woods beyond the lagoon. On our way I again observed *Hippuris*, and under the trees I obtained fine specimens of a white Valerian, the *V. lapathifolia*, and of the elegant *Cardamine geraniifolia*, and, at the edge of a stream, some fine examples of a small fern, *Asplenium Magellanicum*, procured the previous year at Port Gallant, and which I afterwards found to be common throughout the wooded country of the Strait and Channels, in the island of Chiloe, and even in the neighbourhood of Valparaiso.

On the 23d the water of the river had sunk sufficiently to allow of a party of us visiting the mine, in company with the governor of the settlement and a French naval officer, M. Fleurier, at that time resident at Sandy Point, engaged in meteorological and other scientific observations. We had a very agreeable ride through the forest, but found that the mining operations had apparently not made much progress since the time of our last visit, and we noticed but little that

was new to us. I, however, succeeded in procuring two additional plants from the immediate neighbourhood of the mine—one a Composite, the other a low under-shrub, a species, I believe, of *Myginda*. On the evening of the same day a very fine specimen of *Lithodes antarctica* (now exhibited in one of the galleries in the British Museum) was brought up on a fishing-line. The remaining few days of our stay at the settlement were principally occupied in writing letters, to be left behind us to await the arrival of any vessel which might chance to pass through the Strait; and on the afternoon of the 27th we left the settlement, and, proceeding northwards, anchored under Cape Porpesse three hours later. From our situation we could perceive the tent of a shooting party, consisting of four of the officers who had left us some days previously to try their luck with the geese on Elizabeth Island; but by this time it was blowing so hard that we scarcely expected them to join us that evening. They, however, took advantage of a temporary lull in the wind to embark, and got on board about ten P.M., next morning despatching a boat for their spoils, which included upwards of one hundred and eighty geese (*Chloephaga Magellanica*), several dozen of ducks (*Anas cristata*), some oyster-catchers (*Hæmatopus palliatus*), and last, though certainly not least, three swans. That day it was blowing so hard as to compel us to remain at anchor, and the vessel presented much the appearance of a poulterer's shop, from the long lines of geese and ducks hanging up in all directions. We had geese for dinner every day for about a fortnight afterwards, by which time most of us were heartily tired of the diet, and felt as if we would never wish to taste these birds again. The swans belonged to two distinct species, two of them being examples of the *Cygnus nigricollis*, with white body-plumage and black

necks, heads, and bills, the last of which were endowed with a knob of considerable size at the base; while the third was a specimen of the *Cygnus coscoroba*, the entire plumage of which, with the exception of a few black feathers in the wings, was pure white, and the feet and bill pink, the latter being destitute of a knob, and considerably broader and flatter than that of the black-necked species. Both sorts had apparently resorted to Elizabeth Island for breeding purposes, as our party found nests which evidently belonged to them; and earlier in the season, in the month of October, eggs of one or other species were collected on the island by one of the servants of the governor of Sandy Point. This, I think, was the only occasion on which we met with swans in the Strait, though, a month later, specimens of the *C. coscoroba* were obtained in the vicinity of Gallegos river. Both species are noticed by Captain King; and in the journal of Mr. Kirk, who was associated with Lieutenant Skyring in the survey of the Western Channels of Patagonia, I find mention made of islets in the neighbourhood of Obstruction Sound which were covered with immense numbers of "black-necked swans, mixed with a few which had black-tipped wings." Both species also occur in South Chili, and in the countries bordering the River Plate. The skinning of one of the individuals of the black-necked species occupied me fully during the 28th, and I ascertained that neither in it nor in the *C. coscoroba* does a fold of the trachea enter the keel of the sternum.

On the 29th it was still blowing too hard outside our sheltered position to permit of our making a move. A few *Fissurellæ* and other Molluscs were obtained in the dredge in the morning; and in the afternoon the greater number of us landed, and spent some hours rambling about. On stepping

on shore I obtained many specimens of a *Boraginaceous* plant with small yellow flowers, procured the previous year on the coast of St. Jago Bay. This was an *Eritrichium*, identical I believe, with a species which I observed subsequently in Chili. Many other plants were also flowering profusely near the beach, including *Symphyostemon narcissoides*, *Anemone decapetala*, *Geum Magellanicum*, *Armeria maritima*, *Cerastium arvense*, a small species of *Galium*, and *Oxalis enneaphylla*. Of the last mentioned, two very well marked varieties occurred—one, similar to that occurring in the neighbourhood of Sandy Point, with lilac flowers and leaves of the ordinary form, that is to say, with the lobed segments deflexed on the petiole; and the other with whitish flowers, marked with numerous interrupted streaks of bluish purple and very narrow leaflets, which spread out at right angles to the leaf-stalk. In a few specimens of this latter form the streaks on the corolla were almost of a pure blue tint. A striking instance was thus furnished of two very distinct forms of a species co-existing in the same locality. Another plant, that I now discovered in flower for the first time, was a tall *Arabis*, with rather large white flowers, the *A. Macloviana*, recorded previously from the Falkland Islands, but not, in so far as I am aware, from the Strait. The high ground above Cape Negro was in a perfect blaze of scarlet with the blossoms of *Embothrium coccineum*, the only representative of the order *Proteaceæ* occurring in the Strait, and which extends from the south of Fuegia as far north as Valdivia in South Chili. In the Strait and Western Channels of Patagonia it seldom exceeds the dimensions of a tall shrub, and is often not more than one or two feet in height; but in Chiloe it frequently forms a low tree, which presents a very handsome appearance at the flowering

season. In a break in the cliffs of Cape Negro, where a small spring was oozing out of the clay, I found a minute *Myosotis* (*M. albiflora*) and several *Graminaceæ*, not obtained before, together with one or two specimens of *Adesmia pumila*. Among the zoological spoils of this day were a small rodent, with very thick hair, caught by one of the boat's crew, and a fine eagle, shot by one of the officers. This bird, the *Geranoætus melanoleucus*, does not appear to be very common in the Strait, as we only noticed it on one or two occasions, and it was never observed in the wooded country to the southward and westward of Cape Negro.

On the 1st of December I again landed with three companions, and we had a pleasant walk to a fresh-water lake behind Laredo Bay. This, which we estimated as about two miles long, is about the largest mass of fresh water to the north-east of Sandy Point. On the high ground, on our way to it, we passed many hard domes of *Bolax glebaria*, some of which were in flower. On the 2d the wind still continued, and we shifted our anchorage to Laredo Bay, where we remained all next day, when boats were despatched to survey the bay and its vicinity. Next morning (4th), about five o'clock, a large ship, the Italian frigate "Magenta," on her homeward-bound voyage, after a circumnavigation of the world, appeared in the channel outside our anchorage. We at first thought that she was going to pass us without notice, but, on seeing us, she very kindly came over in our direction and signalled to know if we had letters to send, and we thankfully availed ourselves of the opportunity. I did not then know that she had a naturalist on board—Dr. E. Giglioli, so that I missed the pleasure of meeting a fellow-worker in the same field. It being a fine calm day we weighed between five and six A.M., and went over to the

island of Sta. Magdalena, anchoring about half-a-mile from the shore in a bay on the south side. This islet was visited by several of the older navigators, to whom it was known by the name of Penguin Island, on account of the "great store of these birds" encountered there; and at one period, if we may trust to the accuracy of the account given of it in the voyage of Van Noort, was tenanted by Fuegian Indians, but for a very long period it would appear to have been uninhabited by man. It is of much smaller size than Elizabeth Island, but is larger than Sta. Marta. It rises steeply out of the water, like the other islands in this portion of the Strait, presenting at some points high cliffs of boulder-clay, and at others steep banks covered with short herbage.

As we came to an anchor we observed that the ledges on the cliffs were white with birds, and that a large herd of sea-lions were reposing on the beach. About nine o'clock a large party left the ship, some on surveying work, and others in quest of sport. As we pulled towards the shore we had a most curious experience, for the water was populous with sea-lions and other seals, which, from being seldom disturbed by man, were apparently much astonished and but little dismayed at our appearance. A herd of between thirty and forty of the former followed our boats at a few yards' distance, plunging beneath the water, and then raising themselves partially out of it, gazing at us with intentness, showing their white tusks, and occasionally uttering a cry intermediate between a grunt and a roar; while many of the latter, bending themselves into a curve, leaped high out of the water in all directions. The herd on the beach allowed us to land, and then, rearing up so as to display their manes, rushed into the water, from whence they eyed us at a safe distance. But a no less curious sight was in store for us; for on climbing to the summit of one of

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CORMORANT ROOKERY, STA MAGDALENA.

the high banks, we beheld a company of penguins (*Spheniscus Magellanicus*), which, after standing erect and staring at us in a stupid manner for a few moments, shuffled off; their little wings hanging limp at their sides, and their dark gray and white colouring, and reeling movements, suggesting a drunk and disorderly funeral procession. When hard pressed they abandoned the erect position, and crouching down on all fours, if I may be permitted the expression, ran along like rabbits at a very rapid rate, using their wings as fore-legs, till they gained their burrows, fairly ensconced in which they faced their pursuers, and, slowly turning about their heads from side to side, barked and brayed in the most ridiculous manner, offering a stout resistance to being captured by biting most viciously with their strong bills. While contemplating one individual in its den, I was suddenly startled by a loud "Ho-ho-ho-ho-ho" close to me, and turning round perceived another bird, which had boldly walked out of a neighbouring burrow, and was thus addressing me. I succeeded at last, though with much difficulty, in raking an old bird out of its hole with the crook of a walking-stick, and also obtained two young ones in their down.

The most remarkable spectacle, however, was still to come. Pursuing our way over the island, we ere long reached some large hollows, which cormorants (*Phalacrocorax carunculatus*) had adopted as breeding-places. The birds were there congregated in their nests literally in thousands, forming a dense black mass covering a space of many yards; and, on being disturbed, rose into the air in a cloud, winnowing it with their wings so as to produce a sound resembling that of a strong breeze blowing, and almost concealing the heavens from view; while a number of skua gulls, associated with them, gave vent to a tumult of discordant cries. Their nests were regularly shaped flattened

mounds, slightly excavated on the upper surface, and ranged in almost mathematical series, exactly a foot of space intervening between each nest. They were formed of dried grass and other herbage baked into a solid mass with earth and guano; and the generality contained from one to three greenish-white eggs about the size of that of a domestic fowl, and with a rough chalky surface. A spirited and accurate sketch of the scene was executed by one of the officers who was an eye-witness of it, and appeared subsequently in the *Illustrated London News.*

On the steep cliffs of the island a considerable number of birds of the same species had constructed nests of sea-weed, but there were no eggs in any of these, and possibly their owners may have been mateless individuals. Among the other birds observed on the island were three specimens of the sheathbill, none of which were unfortunately obtained, as well as many upland geese and skua and other species of gulls; and we found several nests alike of gulls and geese. The plants comprised about half-a-dozen grasses, a yellow *Viola, Cerastium arvense,* a *Geranium* and *Erodium, Homoianthus echinulatus, Plantago maritima,* and *Chloræa Magellanica.*

In the course of a few hours we returned to the ship, immediately after which we left the island, and passing the remainder of the day in taking soundings, anchored late in the evening in Gregory Bay. We were all greatly interested by our morning's experience, and it was not a little curious to find subsequently how closely our observations coincided with those of Sir Richard Hawkins, in the same locality, nearly three hundred years before. His account of the denizens of Sta. Magdalena is so quaint that I make no apology for presenting it to those of my readers who may happen to be unacquainted with it. He states that

"Before we passed these Ilands, vnder the Lee of the bigger Iland we anchored, the winde being at North-east, with intent to refresh our selues with the Fowles of these Ilands. They are of divers sorts, and in great plenty, as *Pengwins*, wild Ducks, Guls, and *Gannets;* of the principal we purposed to make prouision, and these were the *Penguins.*

"The *Pengwin* is in all proportion like a Goose, and hath no feathers, but a certaine downe vpon all parts of his bodie; and therefore cannot flee, but auayleth himselfe on all occasions with his feet, running as fast as most men. He liueth in the Sea and on the Land; feedeth on fish in the Sea, and as a Goose on the shore vpon grasse. They harbour themselues vnder the ground in Burrowes, as the Conies; and in them hatch their young. All parts of the Iland where they haunted were vndermined, saue onely one Valley which (it seemeth) they reserued for their food; for it was as greene as any Medow in the month of Aprill, with a most fine short grasse. The flesh of these *Pengwins* is much of the sauour of a certaine Fowle taken in the Ilands of Lundy and Silley, which we call *Puffins*, by the taste it is easily discerned that they feed on fish. They are very fat, and in dressing must be flead as the Byter; they are reasonable meate rosted, baked, or sodden; but best rosted. We salted some doozen or sixteene Hogsheads, which serued vs (whilest they lasted) in steed of powdred Beefe. The hunting of them (as wee may well terme it) was a great recreation to my company, and worth the sight, for, in determining to catch them, necessarily was required great store of people, euery one with a cudgell in his hand, to compasse them round about, to bring them, as it were, into a Ring; if they chanced to break out, then was the sport, for the ground beeing vndermined, at vnawares it failed, and as they ranne after them, one fell here, another there, another offering to strike at one, lifting vp his hande, sunke vp to the arme-pits in the earth, another leaping to avoid one hole, fell into another. And after the first slaughter, in seeing vs on the shoare, they shunned vs, and procured to recouer the Sea; yea, many times seeing themselues persecuted they would tumble down from such high Rockes and Mountaines, as it seemed impossible to escape with life. Yet as soone as they came to the Beach, presently we should see them runne into the Sea, as though they had no hurt. Where one goeth, the other followeth, like sheepe after the Bel-weather; but in getting them once within the Ring close together, few escaped, save such as by chance hid themselues

in the borrowes, and ordinarily there was no Drove which yielded vs not a thousand and more : the manner of killing them which the Hunters vsed, beeing in a cluster together, was with their cudgels to knocke them on the head, for though a man gave them many blowes on the body they dyed not : Besides the flesh bruized is not good to keepe. The massacre ended, presently they cut off their heads, that they might bleed well ; such as we determined to keepe for store, we saued in this manner. First, wee split them, and then washed them well in Sea-water, then salted them, hauing laine some sixe houres in Salt, we put them in presse eight houres, and the blood being soaked out, wee salted them again in our other caske, as is the custom to salt Beefe, after this manner they continued good some two months, and serued vs in steed of Beefe.

"The Guls and *Gannets* were not in so great quantitie, yet we wanted not young Guls to eate all the time of our stay about these Ilands. It was one of the delicatest foods that I haue eaten in all my life.

"The Duckes are different to ours, and nothing so good meate ; yet they may serue for necessitie : They were many, and had a part of the Iland to themselves seuerall, which was the highest Hill, and more than a Musket shot ouer. In all the dayes of my life, I have not seene greater arte and curiositie in creatures void of reason, than in the placing and making of their Nests ; all the Hill being so full of them, that the greatest Mathematician of the World could not deuise how to place one more than there was upon the Hill, leaving only one path-way for a Fowle to passe betwixt. The Hill was all leuell, as if it had been smoothed by arte ; the Nests made only of earth, and seeming to be of the selfe-same mould ; for the Nests and the soile is all one, which, with water that they bring in their Beakes, they make into Clay, or a certain dawbe, and after fashion them round, as with a compasse. In the bottome they containe the measure of a foot ; in the height about eight inches ; and in the top, the same quantitie ouer ; then they are hollowed in, somewhat deep, wherein to lay their Egges, without other preuention. And I am of opinion that the Sun helpeth them to hatch their young ; their Nests are for many yeares, and of one proportion, not one exceeding another in bignesse, in height, nor circumference ; and in proportionable distance one from another. In all this Hill, nor in any of their Nests, was to be found a blade of grasse, a straw, a sticke, a feather, a weed, no, nor the filing of any Fowle, but all the Nests and

passages betwixt them, were so smooth and cleane, as if they had been newly swept & washed.

"One day hauing ended our hunting of *Pengwins*, one of our mariners walking about the Iland, discouered a great company of Seales, or Sea-wolues (so called for that they are in the Sea, as the Wolues on the Land), aduising us, that he left them sleeping, with their bellies toasting against the Sunne; we prouided our selues with stones and other weapons and sought to steale vpon them at vnawares, to surprize some of them, and comming downe the side of a Hill, we were not discouered till wee were close vpon them, notwithstanding, their Sentinell (before wee could approach) with a great howle waked them; we got betwixt the Sea and some of them, but they shunned vs not; for they came directly vpon us; and though we dealt heere and there a blow, yet not a man that withstood them escaped the overthrow. They reckon not of a Musket shot, a sword pierceth not their skinne, and to giue a blowe with a staffe, is as to smite vpon a stone; only in giuing the blowe vpon his snout presently he falleth downe dead. After they had recouered the water, they did as it were scorne vs, defie vs and daunced before vs, vntill we had shot some Musket shot through them, and so they appeared no more.

"This fish is like unto a Calfe, with foure legs, but not aboue a spanne long; his skinne is hairy like a Calfe; but these were different to all that euer I haue seene, yet I have seene of them in many parts; for these were greater, and in their former parts like vnto Lions, with shagge haire, and mostaches. They live in the Sea, and come to sleepe on the Land, and they euer have one that watcheth, who adviseth them of any accident. They are beneficiall to man in their skinnes for many purposes: In their mostaches for Pick-tooths, and in their fatte to make Traine-oyle."

Two memorial specimens of our visit to this remarkable island, the inhabitants of which are so amusingly described in the above extract, were preserved—viz., a penguin (*Spheniscus Magellanicus*) and a cormorant (*Phalacrocorax carunculatus*), and their skins, together with those of the other birds obtained in the Strait, are now in the museum of the University of Cambridge. The operation of skinning the penguin was of a most unpleasant nature, owing to the very strong fishy smell, and

the gluey character of the fat of the bird ; but a variety of structural points observed during the process interested me greatly, among which I may instance the remarkable breadth of the scapulæ, the deep colour of the muscles, recalling that of the flesh of a seal, and the curious tongue, the upper surface of which is armed with horny spines, resembling those which occur on the tongue and palate of certain mammals. The cormorant was very successfully skinned for me by one of my messmates (Mr. Ollard), and is a fine specimen of the beautiful species to which it belongs. The carunculated cere of this bird is yellow, and the wings and entire upper plumage, including a narrow crest of elongated feathers on the head, exhibit splendid tints of deep bluish purple verging on black, while the front of the neck, the breast, and the abdomen are snow-white.

On the 5th we remained at anchor, as it was blowing hard, but the weather was fine on the two following days, which were occupied in taking soundings from the ship. Heavy rain, followed by snow, set in on the evening of the 7th, and next day it was again blowing hard, which, however, we did not much regret, as it happened to be Sunday, which was as much as possible preserved as a day of rest. On the 9th, 10th, and 11th the weather was again favourable, and taken advantage of to obtain lines of soundings in Philip Bay, on the coast of which we observed a Fuegian encampment of considerable size. The morning of the 12th was splendidly bright and clear, and a small party of us landed on the coast of Gregory Bay at five A.M., and spent some hours in a pleasant ramble inland. The ground in many places was completely tunnelled with the burrows of the *Ctenomys*, and as I walked over it, I heard at intervals the curious cry of the animal, while several individuals protruded their furry heads and shoulders from

their holes to see what was the matter, quickly withdrawing them on my nearer approach. In the neighbourhood of these warrens I noticed a good many specimens of the great owl (*Bubo Magellanicus*). These were in general perched on the barberry bushes, and were very bold, barking at me in their peculiar fashion, and allowing me to come within three or four yards of them before taking flight. I saw several fine specimens of the military starling, and in the vicinity of a marsh some geese with young goslings. The old birds were very assiduous in their care of their young—not flying off as I came near them, but hiding themselves in the long grass, from which I could perceive them anxiously watching my movements. A few specimens of a beautiful duck, the *Mareca Chiloensis*, which we had not met with during the previous season, were shot by one of the officers. Captain King was, I believe, the first to describe it from examples obtained by him in the island of Chiloe, but he does not appear to have met with it so far south as the Strait of Magellan, where it seems to be rather rare. A small lizard of the species earlier mentioned was also captured, and I observed a minute bee busily gathering the pollen from *Adesmia pumila*, but did not succeed in taking it.

Among the plants obtained on this occasion were the *Calceolaria nana* in full flower and very plentiful, the *Valeriana carnosa*, *Armeria maritima*, a pretty *Sisyrinchium* (*S. filifolium*), and a yellow-flowered plant apparently belonging to the tribe *Alströmeriæ*, of the order *Amaryllidaceæ*, and which seems to have entirely escaped the notice of those botanists who have previously visited the Strait of Magellan. I afterwards found it both in the neighbourhood of Mount Dinero and at the river Gallegos, and sent several specimens to England, which are now among my collections in the Royal

Herbarium at Kew, but which I have not as yet had the requisite leisure carefully to examine.

We left our anchorage in Gregory Bay at eleven A.M. that day, and passed through the first Narrows, anchoring off Direction Hill about four P.M. Thereafter several of the boats were despatched for some hours to take lines of soundings, and a considerable amount of work was thus accomplished. We were rather surprised to observe from our station a large ship flying the Japanese flag lying off Cape Possession, and next morning we went over to her to learn what she was doing, and found that she was the ex-Confederate ram "Stonewall," sold some time previously to the Japanese government, and on her way out to Japan, under the charge of a U.S. captain, being at the present time occupied in supplying a merchant ship, the "Mary C. Dyer," from Monte Video, with coal. She brought us some letters and papers from the flagship then lying off Monte Video, and engaged to take on the correspondence which we had left behind us at Sandy Point.

CHAPTER IX.

EXCURSION TO GALLEGOS RIVER—PLANTS OBSERVED—LOST IN THE WILDS—REMARKABLE PARASITIC CRUSTACEA ON FISH—CONSTANT GALES—SECOND VISIT TO FALKLAND ISLANDS—BOG-PLANTS—PENGUIN-ROOKERIES—MOUNT WILLIAM—FALKLAND SOUND—TYSSEN ISLANDS—TUSSAC GROVE—TAMENESS OF THE BIRDS—FOX BAY—RETURN TO THE STRAIT—EXCURSION IN NEIGHBOURHOOD OF MOUNT DINERO—CONDORS—SECOND VISIT TO QUARTERMASTER ISLAND—FUEGIAN DOGS.

On the 14th, 15th, and 16th of December it was blowing so hard that we could not leave our anchorage, and the wind lasted till about three P.M. on the 17th, when it fell considerably, and advantage was taken of this circumstance to get under way and execute a considerable amount of sounding. On the 18th it was again blowing hard; on the 19th the wind fell, and allowed us again to resume our operations; but on the 20th this unwearied enemy again kept us unwillingly idle. The greater number of us were by this time beginning to feel this perpetuity of gales a severe strain on our patience, and therefore rejoiced when Captain Mayne determined on carrying out a piece of work which promised to afford a little variety—namely, in conformity with instructions received before we left England, to make a trip to the Gallegos river, on the east coast of Patagonia, to institute a search for a deposit of fossil bones discovered by Admiral Sulivan and the present hydrographer of the Navy, Rear-Admiral G. H. Richards, about twenty years previously, and which Mr.

Darwin, Professor Huxley, and other distinguished naturalists, were anxious should be carefully examined.

Accordingly, on the evening of the 21st, a very fine calm day occupied in taking soundings, we anchored a few miles outside of Cape Virgins, and the following morning weighed early and proceeded northwards along the coast, keeping near to the land. We reached the mouth of the river, about forty miles from the entrance of the Strait, early in the afternoon; and after attempting to enter it, and finding that, owing to an alteration in the banks of the estuary, there was to all appearance no channel of sufficient depth to admit of our passage, anchored at some distance from the land. Next morning all the requisite apparatus for the geological campaign, including hammers, picks, shovels, gunpowder for blasting, as well as the necessary gear required for camping out for a day or two, being in readiness, a party, consisting of Captain Mayne, five of the officers, and myself, with a certain number of the crew, left the ship at five A.M. in two boats, one of which, the steam cutter, took the other, the captain's galley, in tow. The day was calm and beautiful, and all seemed to bode well for our excursion. In conformity with the information furnished to us regarding the locality of the fossil-beds, we entered the river, shaping our course for some high cliffs on the left bank, about five or six miles from the entrance. The country to the south of the river was for the most part low and flat, though presenting several distant well-marked peaks, bearing the appellation of the Friars and the Convents; while that to the north possessed a much bolder character, consisting of a series of rounded steep low hills, with intervening radiating valleys and wide flat elevated plains, strikingly different from anything we had previously seen in eastern Patagonia. Landing

soon after six A.M. near the cliffs above mentioned, we fixed on a situation for our tents, and while the camp fire was being lighted and breakfast getting ready, I had time to take a short stroll and survey the surrounding prospect. Our encampment was placed on a flat space of ground close to the river-bank, behind which rose steep grass-grown banks from thirty to fifty feet in height, and rendered of a brilliant golden-yellow colour by masses of the *Adesmia boronioides*, which, along with *Lepidophyllum cupressiforme*, was growing in the utmost luxuriance. Two other plants, also plentiful, neither of which appear to extend as far south as the Strait, were a beautiful *Calceolaria*, with a larger flower and narrower leaves than *C. plantaginea*, and a herbaceous *Euphorbia*, with copious milky juice. Immediately to the east of us extended the line of cliffs, stretching, with intervals of grassy slopes, towards the mouth of the river. At the near end of this, which I had time to reach before breakfast, I found a few of the plates of the dermal armour of a *Glyptodon*, and we all regarded this as an auspicious omen of our success. Our morning meal over, the party dispersed in different directions —the greater number, bent on sport, ascending to the high ground above the banks, while Captain Mayne and I, armed with hammers and chisels, set out to search the base of the cliffs for the deposit of fossil bones. We had a long and most fatiguing walk under a hot sun, over the shingle beneath the cliffs, carefully scrutinising their surfaces, and all detached blocks in their vicinity, for fossils, but without the slightest success. We passed at one part a well of good fresh water, with a plank laid along the swampy ground at the side of it, and not far from this I met with several plants which had never occurred to me in the Strait, including a purple *Lathyrus*, a bluish-white *Polygala*, and a handsome

yellow *Œnothera*. We persevered on our way until we had passed all the cliffs between our camp and Cape Fairweather, when we arrived at the conclusion that it would be useless to prosecute our quest farther in that direction, and accordingly proceeded to make tracks towards camp, Captain Mayne returning by the base of the cliffs, while I scrambled up to the summit to examine those portions which were inaccessible from below. We alike failed, however, in our object, though I obtained several other species of plants, including some handsome *Compositæ*, a small Labiate, found the previous year at Direction Hill, and the yellow-flowered Amaryllid met with at Gregory Bay.

On our return to camp about one P.M., we found that the sportsmen had been more fortunate — one officer having succeeded in shooting a guanaco, while another had procured a fine Rhea, and a third soon after arrived with a specimen of *Cygnus coscoroba*, and some live cygnets, which he had caught at the edge of a small lake at some distance. The latter were most ridiculous-looking gray, downy, long-legged creatures, which stood with their eyes half shut, and their heads reposing on their breasts in an attitude of meditation, recalling accounts of the Phœnix, but, unlike that bird, huffing at any one that disturbed their slumbers. As we did not intend to dine till about three hours later, I determined, though feeling rather tired and footsore with the morning's exertions, to spend the intervening time in botanising, and accordingly left our camp with a folio of drying-paper under my arm, with the intention of walking a short way along a flat tract of ground which extended for some distance up the bank of the river to the west. My plans were, however, altered, in consequence of noticing at the top of one of the steep banks a very fine

species of *Adesmia* growing in rounded clumps resembling those of *Ulex nanus*, armed with weak spines, and covered with beautiful flame-coloured flowers. After securing specimens of this plant, I resolved on keeping on the high ground, and accordingly pursued my way over hill and dale, busily engaged in collecting, till I arrived at the edge of a fresh-water lake, where I found a species of *Acæna* that was new to me. My paper was now pretty well filled with specimens, and finding that it was about three P.M., I judged it advisable to return to camp, to be in time for dinner, which I now felt pretty ready for, having eaten nothing, with the exception of half a ship's biscuit, since seven in the morning. I therefore bent my steps in the direction of a low hill which I believed I had crossed on my way out. After walking for some distance, I reached an extensive tract of flat ground, which it struck me I had not traversed before. This circumstance somewhat perplexed me, but I thought that I could not be mistaken as to the hill in front of me, and so continued on my way over the plain, noticing as I went the *Oxalis enneaphylla* in great profusion. Heavy rain now began to fall, and before long I was soaked through, and began to feel decidedly cold, causing me to realise the satisfactoriness of getting back to the tent, and changing my clothes. After walking for some miles over this plain, which was nearly a dead level, and feeling surprised that I did not sooner reach the hill I was in quest of, I reached the edge of the flat ground, and after descending into a narrow valley, gained the desired elevation, which I believed to be close to our camp. On climbing to its summit, however, I beheld neither camp nor river, but only an apparently endless succession of small hills and valleys, radiating in nearly every direction. I now saw plainly that I had utterly lost my way, and began to con-

sider what, in the absence of a compass, was the best thing to be done in this rather unpleasant fix. After deliberating upon the advisability of attempting to return on my track to the lake, and striking out a new line from thence, I abandoned this idea, as I judged, from the manner in which the features of the country repeated themselves, that it was very doubtful whether I could find my way back there, and that, even should I succeed in doing so, I could not be by any means certain of reaching the camp from it. I thought, moreover, that by pursuing my onward way I must strike the Gallegos river at some point, and this attained, I knew that there could be no difficulty in gaining the tents. Anxiously scanning the prospect, I saw on the horizon in front of me what appeared, from its sharp, clearly-defined aspect, to be the top of a cliff. This I concluded to be Cape Fairweather, and knew by the time I got there I would have arrived at the entrance of the river, and have a walk of about six miles back to camp. I therefore started in the direction of the supposed cape, but after walking for a long way at a very rapid pace, seemed not to be getting any nearer to it, a sufficiently puzzling circumstance. At last it flashed across me that I must be walking in a circle, and I accordingly struck out on a new line, which after a time brought me to the desired cliff-summit; when I found, to my dismay, that instead of looking down upon the river, I had reached the top of a cliff overlooking the open sea, whose waters were quietly lapping on the beach about 150 feet below. I then directed my gaze along the line of coast for any indication of the entrance of the river, or of the ship, but in vain; nothing was to be seen which could serve as a guide whither to direct my steps. It was now seven P.M., and my prospects did not appear altogether of a reassuring nature. I endeavoured to persuade myself

that Cape Fairweather could not be very far off; and accordingly toiled along the land at the top of the cliffs, feeling desperately weary, as I had hardly sat down since I had breakfasted in the morning, and a sensation of drowsiness gradually creeping over me. Struggling on in this way for some miles, fighting against sleep, I now and then imagined that some projecting point ahead was the Cape, but, on reaching it, invariably found that my hopes were groundless. At one time I perceived what I supposed to be a human figure standing at the edge of the cliffs, but on approaching nearer found it to be a huge condor, which allowed me to come within eight feet of it, and did not attempt to move till I brandished my walking-stick, when it slowly flapped its great wings, and rising into the air, sailed off. I continued my walk along the coast till about nine P.M., when the sun setting caused me to realise more distinctly than I had done before, that I had been walking in a north-easterly, instead of a southerly direction. By this time my strength was almost exhausted, and as it was rapidly getting dusk, I felt that I must soon give in for the night; so, to lighten myself, I unwillingly laid down my portfolio of valuable specimens, and walked for some distance inland, looking out for some convenient shelter during the hours of darkness. Passing through some long grass in one of the small valleys which abounded between the rounded grassy hills, I heard, apparently only a few yards off, the peculiar cry of a puma, which made me quicken my steps, as I was entirely unprovided with firearms, and had no desire to provoke an encounter with even such a comparatively cowardly animal, with an oak stick as my only weapon. Shortly afterwards, feeling very thirsty, I was glad to see a pool of water not far off, and hastening to it, and tooping down, took a great gulp, only to find that it was

intensely salt! Darkness was now gathering rapidly, and I listened intently for the noise of voices or guns, but there was an entire silence, save for the rustling of the wind through the grass. By-and-by I heard the neigh of a guanaco, and, looking round, saw it indistinctly at no great distance from me, apparently puzzled to know what I was.

By ten P.M. I felt that it would be useless to attempt to walk farther, as I was utterly done up, and it was too dark to see in what direction I was going. I therefore lay down in the grass in the lee of a low barberry-bush. The grass was soaking wet, and there was a piercing breeze blowing; but I fell asleep for a short time, and wakened with a sensation of deadly cold, accompanied with violent cramps in my limbs. Fortunately, no more rain fell, and the night was clear, with a fine display of stars overhead. I thus lay on the ground, weighing the probabilities of my being able to find my way back to camp next day, or of my leaving my bones to bleach in the Patagonian desert, while the wind rustled through the bushes, and snipes gave vent to their desolate nocturnal cries. The night seemed very long, though in reality short, and I anxiously watched for the morning, noting how the stars moved over the face of the sky, and gradually waned. At last a faint light appeared in a particular spot on the horizon, which satisfied me as to which was the east; day gradually dawned, and by twenty minutes to three A.M., on the 24th, it was light enough to allow me to rise from my lair and set out in a direction intermediate between that where the sun had set the night before, and that whence it was preparing to arise.

It was a bright, clear morning, and I felt more hopeful than the night before, and concentrated my energies into walking as hard as I could. I first traversed a considerable

extent of undulating country, after which I crossed a wide plain, disturbing a skunk, which scuttled off with its feathery tail over its back. After this I descended into a small valley ; then crossed another plain, and then reached some more hilly country. Suddenly coming to a gap between two knolls, I saw, to my relief, a distant blue hill-top which I knew to be situated on the south side of the river, and thus ascertained my true position, and realised that my troubles were nearly over. Soon I saw the river itself, and began to descend towards it, presently hearing a shout at some distance, and seeing a figure run rapidly down a neighbouring hill. I presently recognised one of the officers, who shortly joined me, with a brandy-flask in one hand and a revolver in the other. A little more than half-an-hour sufficed us to reach the tents, where I met the remainder of the party, who had gone through much fatigue and anxiety during the previous night and that morning in the search for their missing companion, having formed diverse conjectures as to my fate, some imagining that I had fallen over the cliffs, and others, that I had fallen a prey to a puma which had been seen the day before. Thus ended safely what might have been a very serious adventure, and which taught me a lesson in caution—namely, the inadvisability of carrying on solitary botanical explorations in unknown regions without a compass.

After breakfast, as there seemed to be no particular end to be gained by remaining on shore for a longer period, we returned to the ship, getting on board about nine A.M. In our absence some large fish, resembling ling in general appearance, had been taken ; and attached to the gills of one was found a very curious crustacean which had been preserved for me by one of the officers. This remarkable creature belonged to the genius *Sphyrion*, of Cuvier, founded on a parasite taken

on the throat of a Gadoid fish at the Cape of Good Hope during the voyage of the "Freycinet," and described by Quoy and Gaimard under the name of "Chondracanthe lisse." A second species has been more recently described by Kroyer, from the lump-fish (*Cyclopterus lumpus*) of the northern hemisphere, under the name of *Lesteira lumpi;* and this one taken at the Gallegos river appears to constitute the type of a third, of which I have found no description, although specimens of it have existed for many years in the Museum of the Royal College of Surgeons. Of the history of these examples, Professor Flower, who had the kindness to show them to me, knows nothing; but it is possible that they may have been procured on one of the earlier South American surveys, as I find that Captain King, in the account of his visit to the Gallegos river, makes mention of large fish, regarded by him as a species of *Ophidium*, and called ling by his ship's company, which had "two parasitical animals attached" to them—one a "*Cymothoa*," probably *Pterelas magnificus*, Dana; and "the other a species of *Lernæa*, which had so securely attached itself under the skin, as not to be removed without cutting off a piece of the flesh with it." This latter, I think it very probable, was the *Sphyrion* met with by us; as, if my memory does not play me false, other examples obtained about a month later were attached alike to the gills and to the skin of their host. Acting on the belief that this *Sphyrion* is an undescribed species, and first met with by Captain King, I have named it *S. Kingii*, in honour of that excellent observer.

We weighed soon after we got on board, and, returning southwards to the Strait, anchored under Dungeness. The morning of the 25th, Christmas day, was tolerably fine, but there was a very threatening barometer (28°80′56″.) An officer, who had been left with his boat's crew at Cape Posses-

sion, while we were at the Gallegos, was, by this time, encamped on Dungeness, and came on board to report himself, bringing with him a fine female condor which he had shot at the cape. He had also made two interesting botanical discoveries while there, having obtained specimens of the *Botrychium lunaria* which I found the previous year at Oazy Harbour, as well as of a deep yellow *Œnothera*, the only representatives of the genus which I ever procured from the Strait, though, as I have mentioned a few pages back, a species is common at the Gallegos river. We got under way early in the forenoon, and began to take soundings on the Sarmiento Bank, but soon found that the barometer had proved a true prophet in this instance, a gale setting in, which compelled a speedy suspension of operations, causing us to re-enter the Strait (a matter of considerable difficulty), and anchor outside Dungeness. The wind freshened by degrees, and during the afternoon and evening blew with a greater amount of fury than we had ever experienced in these regions. Although we were lying at but a very short distance from the land, it was generally hidden from our sight by the driving spray, while the wind howled through the rigging, and the vessel strained at her anchor. Despite these untoward circumstances, however, our Christmas dinner went off very well, and we passed a pleasant evening over reminiscences of past events, mingled with speculations as to future prospects. The gale continued to rage throughout the greater portion of the night, and on the forenoon of the 26th it was still blowing, though with diminished vehemence. There was a lull during part of the afternoon, which permitted a small amount of work in the way of sounding being accomplished; but the wind again freshened at 6 P.M., and blew hard till 8.30 P.M., when heavy rain setting in, it fell rapidly.

The 27th was a beautiful calm day, and employed in sounding the Sarmiento Bank. In the evening we anchored off the inner side of Dungeness, and two officers who had been on shore there returned to the ship. Next morning it came on to blow hard, and as we were on a lee-shore we shifted our anchorage well into Possession Bay. There was a very heavy sea on, and the vessel rolled to a greater extent than she had yet done in the Strait. Numbers of stormy petrels were flying over the waves in our vicinity, the first observed by us so far south. The wind went down in the evening, and the 29th (Sunday) was tolerably calm. An officer, who had been on shore for some days engaged in tide-watching, returned in the evening, and brought me a specimen of a Cephalopod, of the genus *Ommastrephes*, but, unfortunately, in too bad condition to be worth preserving. The aspect of the weather on the morning of the 30th was of a very doubtful nature, so that we did not get under way early; but a certain amount of sounding was carried on during the latter part of the day. From this time till the 7th of January 1868, it blew so persistently that we could not make a move. The ship's company occupied a considerable amount of their spare time in fishing from the vessel, and caught several specimens of the large fish taken at the Gallegos river, as well as one or two individuals of a ray of considerable size, and numerous examples of the common British dog-fish, *Acanthias vulgaris*. Several good specimens of *Sphyrion* were met with on the ling-like fish, and two parasitic Isopodous Crustacea also occurred —one a *Cirolana*, apparently not distinct from *C. hirtipes*, and the other, which was elegantly tinted with bright purple around the edges of the segments, the *Pterelas magnificus* of Dana.

On the 7th heavy rain fell in the morning, but the remainder of the day was fair and calm, and occupied in sound-

ing on the Sarmiento Bank. The 8th* and 9th were also fine, and similarly employed; on the 10th there was a good deal of both wind and rain; and on the afternoon of the 11th we left the Strait for the Falkland Islands, to fill up with coal and provisions. The 12th was a lovely calm day, and we proceeded on our course most comfortably. We observed some very fine albatrosses, and a solitary penguin, which was progressing at a rapid rate by means of a series of flying leaps, presenting much the appearance of an animated beer-bottle. A breeze sprang up in the night from the N.N.E., and next morning we were rolling and pitching most unpleasantly. The direction of the wind caused us to keep to the south, instead of to the north, of the islands, as on the former occasion, and towards evening we got fairly under the lee of the land, and so went on our way more quietly. A thick mist, however, prevailed, so that it was not till ten A.M. on the 13th that the land was made and our position ascertained. That day we kept up a good rate of speed under steam and sail, and not long after noon we entered Stanley Harbour, where we found H.M.S. "Narcissus" lying, she having arrived the day before. The aspect of the settlement did not strike us as more inviting than on our former visit, and as it was a showery afternoon but few of us went on shore. The following afternoon was devoted to a round of calls on the inhabitants of Stanley, and on the morning of the 16th (a rather pleasant day), I landed with Dr. Campbell, and had a long walk across the country to a bay situated to the south of the harbour, and not far from Port Harriett. We obtained some fine specimens of *Callixene marginata* and *Oxalis enneaphylla* in flower, and in

* On the 8th, shortly after noon, we ran on a rock on the Sarmiento Bank, not laid down in any of the charts, and stuck on the top of it for about an hour, being released when the tide rose. Comparatively little damage was fortunately, sustained.

the more boggy localities a small species of sundew, the *Drosera uniflora*, was very plentiful, although easily overlooked from its minute size and its occurrence among plants of *Gaimardia*, a low herb belonging to the order *Desvauxiaceæ*, which forms a large portion of the damp turf alike in the Falkland Islands and western part of the Strait of Magellan, and is readily recognised by the peculiar aspect of its shining somewhat triangular-shaped leaves. On the beach of the bay we observed numerous bones of Cetacea lying, and picked up a few sponges and some dried specimens of a very curious large Alga, the *D'Urvillæa utilis*, the fronds of which are formed of very large cells, transversely arranged so as to present a remarkable resemblance to honeycomb, particularly when in the dry state. On the 17th I walked with two companions to a stream of stones in the neighbourhood of the settlement, and found one or two plants that were not in flower at the time of our former visit—a pretty white-flowered Composite, the *Chabræa suaveolens*, among the number. Before going on board we went to see a collection of penguins from various localities in the islands, collected by the Zoological Society's keeper Secante for the gardens. Five species were represented—*i.e.*, the King (*Aptenodytes Pennanti*), Jackass (*Spheniscus Magellanicus*), Gentoo (*Eudyptes chrysocome*), Macaroni (*Pygoscelis Wagleri*), and Rock-hopper (*Eudyptes nigrivestis*); and they formed a most amusing assemblage—some prancing up and down, with their little wings stuck out, with an air of bustle and infinite self-importance, some walking slowly up to us, and gazing at us with solemn curiosity, while others remained stationary and apparently lost in thought.

Of these species the Rock-hopper (*Eudyptes nigrivestis*) is perhaps the most common at the Falkland Islands; and two large "Rookeries," as they are termed, of these birds occur not

very far from Stanley—one at Kidney Island, on the southern side of the entrance to Berkeley Sound, and the other at Sparrow Cove, off Port William. Circumstances did not, to my regret, permit of my visiting either of these, but I extract the following short account of that at Sparrow Cove from Captain Mayne's Journal:—"The rookery was in a sort of small cove, the sides of which, though not perpendicular, were very steep, and about 100 feet high; the entrance to the cove was narrow and steep, with rugged bluff rocks on either side, the whole making a kind of rugged amphitheatre, with water for the pit. All the sides were rugged, with projecting knobs of rocks jutting out in all directions, and every part of the whole of this was covered with penguins. My estimate of the number was the lowest made, and I guessed it at 20,000; but there might have been any number between that and 50,000 or 60,000."

On the 21st I walked with a companion to Mount William, a remarkable rugged hill eight hundred feet high, about five miles distant from Stanley. The upper part of the Mount is formed of a mass of gray quartz lichen-incrusted strata, inclined at a very high angle, and broken into great fragments apparently by some subterraneous upheaval; and streams of stones flow down the sides. The summit commands a very wide view of the East Falkland, and we thus gained an excellent idea of the characteristic desolate scenery; deep inlets, wide plains, and rugged hills; quartz cropping out everywhere, in some places in broken ridges like the spinous processes of the vertebral column of some huge buried animal, the combined effect reminding one of old pictures of the appearance of the earth immediately after the deluge. In a crevice in the rocks we found some good specimens of a fern, *Aspidium mohrioides*, which had previously occurred to us

in the Strait, and lower down on the hill the pretty little *Rubus* (*Dalibarda*) *geoides* was plentiful. This plant, one of the few South American species of its genus, the Falkland Island strawberry of the colonists, has long slender trailing stems, with small shining green leaves, and white or pale pink flowers, succeeded by deep red fruits about the size of a large raspberry, and possessed of a very pleasant flavour. In addition to the Falkland Islands, it is plentiful throughout the damp region of the Strait, and along the west coast of Patagonia. Chiloe was the northernmost locality where I observed it, but possibly it may range as far as Valdivia.

On the 24th I had a long walk to a bay beyond the harbour visited by me on the previous year. I again found many great branches of *Lessonia*, clothed with lesser Algæ, lying about, and the tide having fallen considerably I observed numerous fine specimens of another large sea-weed, the *D'Urvillæa Harveyi*, growing in forests on the rocks. The strong cylindrical stem in most cases presented the appearance of being sunk in a kind of socket in the great solid sucker-like root. The fronds, unlike those of *D. utilis*, which also occurred, but more sparingly, did not present a honeycombed arrangement of cells.

Having filled up with coal and provisions, we left Stanley Harbour on the morning of the 28th, and as, in consequence of an arrangement entered into with the Admiral on board the "Narcissus," it had been settled that we should leave a party from that ship in Falkland Sound, between the East and West Islands, to recover a cargo of copper from a wreck, we steamed for the northern entrance of the Sound, carrying with us a large deck-cargo, composed of boats and other gear belonging to the wreck party. The day was at first misty and drizzling, but gradually improved, and the afternoon and

evening were fine. We entered the Sound in the course of the afternoon, and were agreeably surprised by finding the scenery on either side of a considerably more attractive character than that in the neighbourhood of Stanley—the land presenting a less barren appearance, and the groves of tussac-grass, which here we saw for the first time in luxuriance, imparting a pleasing shade of green to the landscape, the quiet evening light also contributing to "lend enchantment to the view." It was dead calm, a rare phenomenon in these parts, when we anchored for the night at Swan Island, not far from the Tyssen group, close to which the wreck was situated. Soon after we came to a halt one of the men brought me two specimens of a *Myxine*, of the same species previously taken in the Strait, which he had caught on a line. Next morning we moved on to the Tyssen Islands, only a few miles from our last night's position. We had had the dredge over during the night, and hauled it in before we shifted, but with poor results, a *Terebratula* and a small *Natica* being almost the sole proceeds obtained. A female dog-fish (*Acanthias vulgaris*) was caught by one of the men, and on being opened, three live young ones, each with the yolk-bag attached, were found in the interior, and when released swam actively about in a basin of water.

Early in the forenoon a number of us landed on the largest island of the group, which the wreck party had selected as their head-quarters for the month or six weeks which they expected to spend in solitude. This island was, I should think, about a mile or a mile and a half long, and was girdled with a broad belt of tussac. In walking along the beach I observed that rocks of clay-slate appeared to be the principal formation, and I did not notice any vestiges of quartz. Fragments of several common Strait shells, includ-

ing *Voluta Magellanica*, *Mytilus Magellanicus*, *Chione exalbida*, etc. etc., were profusely scattered about, but as I found nothing of a novel or interesting description, I soon forsook the shore for the high ground above it. This was the first opportunity that I enjoyed of visiting a tussac grove, and it made a most striking impression on my mind as I wended my way along the narrow winding natural pathways between the separate clumps of grass, the leaves of which waved high overhead in graceful curves. The average height of the plants I should estimate as between ten and twelve feet, while the mass of roots belonging to each varied from a foot to a foot and a half in height by two to three feet in diameter. Among the roots jackass penguins had formed their burrows in numbers, and as we walked through the groves we were accompanied by numerous individuals of a little dusky-brown bird, the *Opetiorhynchus antarcticus*, which, when we sat down, came quite close to us, being even more familiar than our English robin, a specimen on one occasion lighting on one of the sportsmen who was lying in wait for geese, and hopping about over him in the most unconcerned manner. The military starling was also common, and hardly less tame. After a time I ascended to the summit of the island through a gap in the tussac, meeting with specimens of a very stout tall-growing *Carex*, and several Compositæ, and finding the Falkland Island tea-plant, *Myrtus nummularia*, and *Rubus geoides*, covering the surface of the ground for yards, the beautiful red fruits of the latter half buried in the moss of the soil. On a patch of ground which appeared to have been burnt, *Senecio vulgaris* occurred in great profusion, undoubtedly, I should suppose, introduced, but by what agency it is not easy to form an opinion.

The tameness of the birds, in general, was most remarkable. The brown skua gulls (*Lestris antarcticus*), of which

there were numbers, flew about us, uttering their harsh, scolding cries, and several times, when walking by myself, they swooped at me in such a menacing manner that I was obliged to make them keep their distance by striking at them with my stick. The common brown duck of the Strait swam in flocks close to the beach, and the kelp geese (*Chloephaga antarctica*) were almost equally bold. The upland geese (*Chloephaga Magellanica*) were plentiful, and allowed the sportsmen to approach within a few yards of them without taking alarm, and a pair which I disturbed in one spot ran along in front of me without taking the trouble to fly off. I observed several specimens of a large owl, and two species of hawks, one a dark-coloured bird, which I had not seen in the Strait, the other coloured much like a kestril, but about twice the size of that bird. One of the latter flew about so close to me that I threw my stick at it once or twice, and on one of these occasions it coolly lighted on the missile as it fell to the ground. I have already, I think, remarked on the much greater tameness of certain species of birds at the Falkland Islands, as compared with the same kinds in the Strait, a circumstance which, perhaps, may be partially accounted for by the greater scarcity of foxes in the former locality.

On the afternoon of this day great numbers of the smaller *Lithodes* of the Strait (*L. verrucosa*) were taken by the men, and I found that at least nine-tenths of them were males. A few specimens of another Crustacean, for long known as an inhabitant of the Falkland Islands, the *Eurypodius Latreillii*, were also obtained. Three other species of the same genus—the *E. septentrionalis*, *E. brevipes*, and *E. Audouinii*—were procured by me in various localities in the Strait of Magellan and western coast of Patagonia; and it would not require a naturalist to be deeply imbued with Darwinism to believe

that all four species were originally derived from a common stock.

The following morning (30th) the Argentine captain of a small sealing schooner, then at the Tyssen Islands, Don Luis Piedra Buena, presented me with a fine specimen of a King penguin (*Aptenodytes Pennanti*) from Staten Land, which had died on board his ship the night before, as well as with some beautiful casts of fossil univalve shells, apparently *Turritellæ*, from a deposit on the banks of the Santa Cruz river, on the east coast of Patagonia. Don Luis is a most intelligent, well-informed man, and I had much interesting conversation with him about the regions with which he was familiar. One of our number who was on shore on this day shot a fine male specimen of the night-heron (*Nycticorax obscurus*) previously observed in the Strait. Having seen the wreck party comfortably established on shore, we weighed about four P.M. and proceeded on our way through the Sound; but as, on nearing the southern entrance, we found that the weather had assumed a threatening aspect, the barometer falling rapidly, and the wind against us, we anchored in Fox Bay in the West Falkland Island between seven and eight P.M.

The 31st was a most beautiful day, but as the wind continued still unfavourable we remained at anchor, and a party of us landed in the morning to explore the neighbourhood. On the beach I obtained a very curious snow-white dried sponge, resembling at first sight a mass of bone with large cancellæ. On the green sloping banks above the shore I found flowering specimens of two Orchids (species of *Chloræa*), which I had not met with in the Strait, as well as of two familiar British plants, *Senecio vulgaris* and *Sonchus oleraceus;* and in ascending a hill I came across numerous fine clumps of the Balsam-bog, so compact in their structure that I could

jump on the top of them without leaving the print of my feet. As the day was warm the balsam was exuding abundantly from the plants in large milky tears, which on drying changed to an ochreous tint. From the summit of the hill (846 feet according to the chart) I gained an extensive view of the country around, which was more interesting in its general appearance than those parts of the East Falkland Islands which I had previously seen, the hills being higher and less barren-looking, and numerous patches of fresh water of considerable size being scattered about, while various small streams ran down in the hollows between the hills towards the beach, which was fringed with patches of tussac. I was in hopes of meeting with specimens of the Falkland Island box, (*Veronica decussata*), but was disappointed. The geese and ducks were so tame that many fell a prey to the sportsmen, and a fine buzzard (*Buteo erythronotus*) was also shot while busily employed in feeding on one of the victims. Late in the afternoon, while waiting for our boat, we indulged in a vegetable diet of wild celery and tussac, and were not surprised at the partiality evinced by cattle for the latter, as the base of the culm is crisp and succulent, with an agreeable flavour, resembling that of a hazel-nut. Nearly all the rocks on the beach in this locality, I may remark, were of a finely laminated sandstone, a rock not observed by us in other localities visited in these islands.

The morning of the 1st of February was bright and sunny, with but little wind, but that little, unfortunately, not in our favour. We left the bay, and proceeded onwards under steam, skirting along the south-eastern coast of the West Falkland Island, and passing not far from the entrance of Port Edgar and Port Albemarle. Arrived opposite Cape Meredith, we took our departure from the land, shaping a

W.S.W. course. As we moved on very quietly, I devoted the day to a most unpleasant task, the skinning of the King penguin given me two days before. The mere process of removing and cleaning the skin of so large and oily a bird occupied so much time, that I had but little leisure to bestow on its anatomy. One very curious point noticed, however, was a very complex arrangement in connection with the tips of the quills of the feathers. As a rule, the tip of each feather (which projected on the inner side of the skin) was provided with six whitish radii, probably formed of involuntary muscular fibre, and the base of the angle between each radius was closed by another narrow band, so that each feather formed the central point of a hexagon, and possessed six muscular or ligamentous bands proper to itself and six common to the neighbouring feathers. The breadth of the scapulæ (fully an inch) was also very noteworthy.

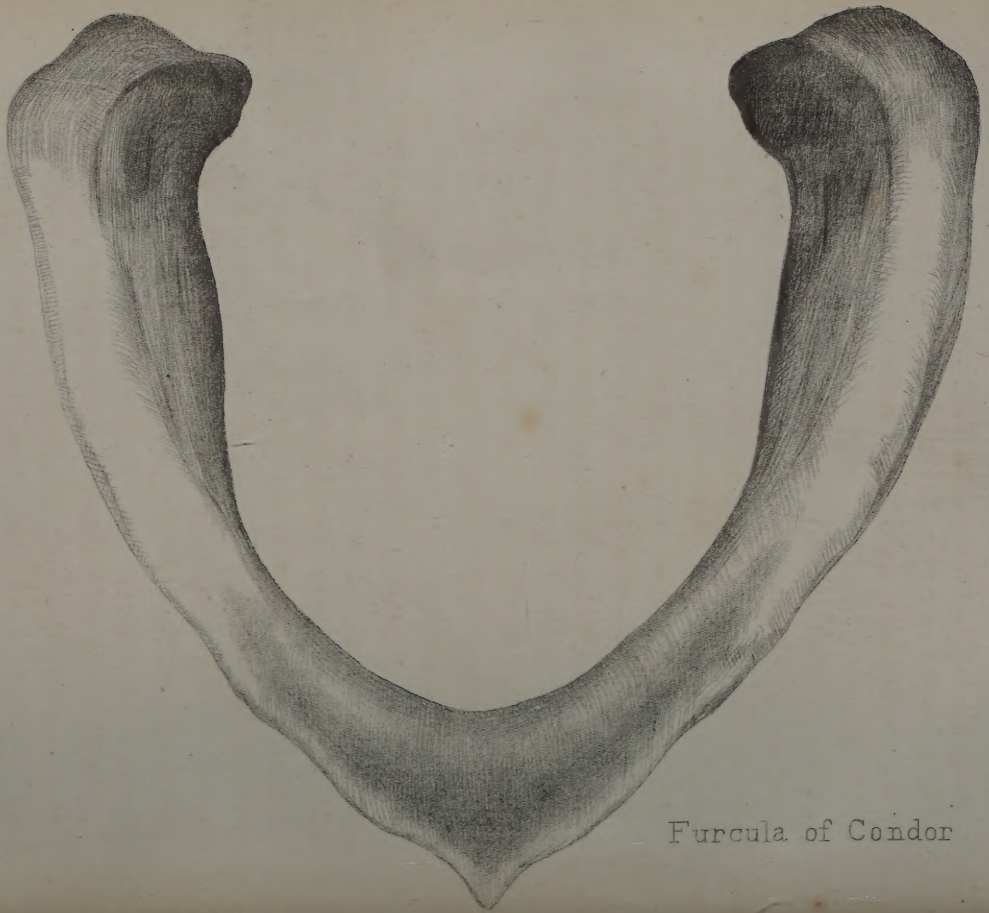
During the night the wind freshened ahead, while the barometer fell, and by the morning of the 2d it was blowing hard from the south-westward, and we steamed on our way very uncomfortably. The 3d was a fine bright day, and the sea had gone down considerably. The wind fell at about 11 A.M. and then backed to the N.W. At 3.30 A.M. on the 4th Cape Virgins was sighted, and we entered the Strait rather more than an hour later, anchoring under the outer side of Dungeness at half-past five A.M. It blew hard during all that day, and throughout the 5th, 6th, and 7th, and we began heartily to wish that we were done with this portion of the Strait, and rejoiced in the prospect of going west later in the season, not fully realising the unpleasantness of the almost perpetually rainy weather which we would there be called on to encounter. Some fish were caught on the 6th, and among them several individuals of a species which we had not previously obtained.

I preserved a small specimen which had a Siphonostomous Crustacean of the genus *Chondracanthus* attached to the roof of its mouth ; and a careful examination of it in the beginning of the present year, with the valuable assistance of Dr. Günther, proved it to be the *Merluccius Gayi* of Guichenot, a species of hake very imperfectly described in Gay's *Historia Fisica de Chili*.

The 8th was a bright, sunny day, with only occasional gusts of wind, and Captain Mayne took advantage of the improvement in the weather to land on Dungeness Spit, with one of the surveying officers, to obtain sights. On their return, they brought me some fine specimens of a beautiful vetch, the *Lathyrus Magellanicus*, which I had not seen previously, and which would appear to be rare in the Strait. It came on to blow at night from the north-east, but the wind died away before the morning of the 9th, leaving a heavy swell behind it. On the morning of the 10th it was again blowing, but the wind gradually fell, so that we were able to weigh early in the afternoon, and proceed out to the Sarmiento Bank, where we spent the remainder of the day in sounding, anchoring on the bank at 8.30 P.M. It was blowing pretty hard during the greater part of the night, but by the morning of the 11th it was again calm, and a good day's work accomplished, the Sarmiento Bank being finished, and some lines of soundings in addition run between Cape Espiritu Santo and Catherine Point. In the evening we anchored off the Point, and for the next three days it blew too hard to permit of our moving. The 15th was occupied in sounding Lomas Bay on the Fuegian coast, and in the evening we crossed over to Dungeness Spit, and there anchored.

Captain Mayne having by this time determined on proceeding to Sandy Point, where it seemed probable that letters were awaiting us, resolved to leave an officer on shore near

Mont Dinero, on the Patagonian coast, for the purpose of taking a series of magnetic observations during the absence of the ship, and I gladly availed myself of the permission to accompany him if I were so disposed. We therefore left the vessel early on the afternoon of the 16th, with the intention of landing opposite the Mount, and there pitching our camp. As we, however, found on approaching the locality that there was too much surf on the beach to permit of our landing there with safety to the delicate instruments in charge, we pulled back to Dungeness, and there entered a curious winding creek like a river, which being land-locked has always smooth water in it. Close to this the tents were pitched for the day, and we set out on a walk in the direction of Cape Virgins, watching with much amusement the gambols of the sea-lions in the water. On our return to camp in the evening, we dined, and a few hours later turned in to prepare for an early start next morning. On the 17th, we rose at half-past one A.M., and after a rapid breakfast the gear was packed into the boat; and when we had pulled to the entrance of the creek, sail was hoisted, and we set off to our destination in the dim moonlight. The land, seen in indistinct shadow in the uncertain light, had a strange ghostly effect, and the experience was altogether a memorable one. Occasionally we disturbed flocks of gulls sleeping peacefully in the water, and they flew off in great confusion. By-and-by a faint yellow streak began to make its appearance on the eastern horizon, and the light gradually stole in till we had a fine red sunrise. We reached the spot fixed upon soon after five A.M., landing without difficulty, and pitched our tents on a smooth flat space of ground between two hillocks, and close to a small stream of excellent fresh water, a rather scarce commodity in eastern Patagonia. I spent the day



Furcula of Condor

principally in roaming about in search of specimens, but met with very little that was new to me, with the exception of a curious little Umbelliferous plant which I found growing in pools of water mixed up with the tufts of an aquatic mass. This was the *Crantzia lineata*, which also occurs in the Falkland Islands, North America, Australia, and New Zealand.

On the morning of the 18th, while we were at breakfast in the tent, one of the men communicated the somewhat startling intelligence that there were "comets flying all round the tents," and on our emerging to contemplate the phenomenon in question, we beheld seven or eight huge condors sailing about in the air at some distance over-head, apparently on the look-out for what they could pick up. After this they were our daily companions, and I several times noticed with interest that when they were flying at no great height, the sound produced by the air passing between their huge primary and secondary wing-feathers, which are widely separated during flight, presented an almost exact resemblance to the musical tones emitted by telegraph-wires in certain states of the atmosphere.

Our life on shore passed very pleasantly, though without much variety, as we had bright sunny weather, which allowed us thoroughly to appreciate the pleasures, by no means small, of camping out. On the 22d, the ship was observed sounding in Lomas Bay, and we thought of striking our tents and embarking for Dungeness, there to wait her arrival, but the wind arose, and produced such a heavy surf on the beach, that we judged it prudent to remain where we were. The wind, however, fell in the evening, and next morning we rose at an early hour, and after some trouble in getting the boat through the surf, hoisted sail, and proceeded to Dungeness, where we found the "Nassau" lying at anchor. We found that a large supply of letters and papers

had been obtained at Sandy Point, where many changes had taken place since our last visit; a new governor, Don Oscar Viel, having come down from Chili, and a large detachment of emigrants having arrived from the island of Chiloe.

The 24th was a perfectly calm day, and we crossed over to Lomas Bay in the morning. Four boats were despatched to sound, but heavy rain setting in about noon gradually put a stop to the work by concealing the land from view. The following day was spent in Lomas Bay; and on the 26th, after spending some time in sounding off the Orange Bank, we passed through the first Narrows (our transit being a very tedious one, as the tide was against us), and anchored in the evening in St. Jago Bay. On the morning of the 27th we moved on to Gregory Bay, and there anchored for a few hours, which allowed of a ramble on shore, in the course of which I collected a few plants, including an aquatic one, the *Myrioplyllum elatinoides*, previously known from the Falkland Islands. We got under way again before noon, and went through the second Narrows, dropping one of the boats off Peckett Harbour to execute some soundings, and then proceeding over to Sta. Magdalena to leave a party there. It was a splendid calm afternoon when we reached the island, and when we anchored to drop the boats the scene around us was of a most striking character. The island stood out sharp and clear in the early evening light, with its cliffs white with sea-birds, and the beach covered with sea-lions, while in the water around the ship hundreds of seals were disporting themselves, leaping high out of the water, their bodies bent as usual in a bow-shaped curve. After leaving the boats we moved on to Sandy Point, which we did not reach till after dark; sending up a rocket to attract attention, and burning a blue light to ascertain our exact position. When we landed next morning we found various improvements being energetically

carried out in the settlement, under the superintendence of the recently appointed governor; and the noise of the axes of the emigrants was to be heard breaking the silence of the woods. A few parrots and one or two other birds were shot, and I obtained specimens of a viscid yellow-flowered Composite, a species of *Madia*, found in the previous season in Fuegia. The following day, which was very fine, a party of us, consisting of Captain Mayne and three of the officers, with myself, landed early, and after breakfasting with the governor, rode out with him to look at the deposit of coal. The woods through which we passed were in great beauty, the foliage of the greater number of the trees appearing of a vivid green in the bright sunlight; while here and there, where the river had lately overflowed its banks, groups of trees, the base of whose trunks was buried in a deposit of sand and clay, had assumed prematurely autumnal tints of yellow, brown, and red.

We remained at Sandy Point till early on the morning of the 2d of March, when we returned to Sta. Magdalena to pick up the boats left there. The officers, on coming on board, brought me a fine specimen of a sheathbill (*Chionis alba*), and one of a skua gull (*Lestris antarctica*). We anchored off the island that evening, and as next morning it was raining heavily, we did not get under way till nearly eleven A.M., when we went slowly over to Laredo Bay to pick up the boat left at Peckett Harbour. The 4th was a magnificent day. The ship was employed in sounding on the Fuegian coast, and between five and six P.M. she anchored at the entrance of Gente Grande Bay, inside Quartermaster Island. Immediately thereafter a large party landed on the low spit, which, as I have earlier mentioned, occurs at the northern extremity of the island. As we stepped on shore we noticed the only specimen of a kelp-goose (*Chloephaga antarctica*) ever seen by us in the eastern part of the Strait; and I found the steep

bank leading from the spit up to the high ground covered with plants of *Arabis Macloviana* gone to seed. The cormorants were, if possible, more numerous than on our visit in 1867, and on being disturbed rose into the air in thousands, raising a thick cloud of dust, which had a most powerful odour of guano. It was curious to observe that, though of the same species with those observed at Sta. Magdalena, the nests were not so carefully constructed or so regularly grouped. A few young birds were encountered, clothed with blackish down, and unable to fly, but which ran very fast, sometimes tumbling over the nests. One of them, in its hurry to escape my pursuit, soused itself in a pool of black mire, and emerged in a draggled and forlorn condition. Skua gulls were abundant, though not so noisy or so fierce as those which we encountered at the Tyssen Islands, and geese were plentiful, but very shy. A considerable number of bandurrias were also observed, and a few specimens shot. We returned to the ship in the moonlight, about eight P.M., to a late dinner.

The 5th was another beautiful day. We left our anchorage between seven and eight A.M., and proceeded along the Fuegian coast southward of Gente Grande Bay. Soon after breakfast I had an opportunity of accompanying a couple of the surveying officers on shore at Gente Point. A party of seven Fuegians, accompanied by several dogs, were assembled on a low hillock close to the beach, but decamped as we approached the land in our boat, much to my disappointment, as I was very anxious to hold intercourse with this tribe, which, as I have earlier stated in the course of this narrative, appears to be very distinct from those occurring to the westward. We found the ground close to the beach tunnelled with the burrows of the *Ctenomys;* and near the hill a great number of shells of limpets, *Fissurellæ,* and mussels, on which the Fuegians had evidently been recently regaling themselves,

were accumulated. While the others were engaged in taking a round of angles, I visited three shallow patches of salt water in the neighbourhood. I found that the Fuegians had crossed one of these, and I measured several of their footprints left in the clay at the edge of the water. These were very broad across the toes, and narrow at the heel, the largest being about eight inches and three-quarters in length, while the smallest measured only seven inches. Three Fuegian dogs wandered about in our vicinity, barking and howling dismally. The first was much like a fox in size and general appearance, and of a reddish-gray colour ; the second had a piebald smooth coat, with drooping ears ; while the third was clothed with long dark brownish-black hair, had erect ears, and presented a marked resemblance to a small wolf. As usual, I made a collection of the plants of the locality, obtaining, among others, two yellow-flowered species of *Senecio, Homoianthus echinulatus, Empetrum rubrum, Armeria maritima*, a species of *Hordeum*, the *Eritrichium* found at Sta. Magdalena and other localities, and *Phacelia circinata*, a plant common in the neighbourhood of Sandy Point. The dredge yielded in this locality a fine orange-coloured sea-cucumber, about three inches long ; several specimens of *Galathea subrugosa*, and a curious Isopod of the genus *Cymodocea*, which, believing it to be new, I have named *C. Darwinii*. In the afternoon I landed on another part of the coast, nearly opposite Sandy Point, and obtained specimens of *Geum Magellanicum*, a yellow *Sisyrinchium*, etc. Here, as in the former locality, the burrows of the *Ctenomys* abounded, and probably this is nearly the southernmost boundary of the animal. We anchored early in the evening off Sandy Point, and next day there was such a heavy swell on the beach that we could not land ; while heavy rain fell, as if to prepare us for the experience we were shortly to be called upon to encounter in the west.

CHAPTER X.

LEAVE SANDY POINT FOR THE WESTWARD—BOTANY OF PLAYA PARDA COVE—SHOLL BAY—CHANNEL INDIANS—WET WEATHER—OTTER ISLANDS—GRAMMITIS AUSTRALIS—GLACIERS—ICE AT THE ENTRANCE OF EYRE SOUND—EDEN HARBOUR—SMALL FROG—PODOCARPUS—LEPIDOTHAMNUS—MITRARIA—HALT BAY—WEINMANNIA—LOMATIA—ENTER THE GULF OF PEÑAS—BAD WEATHER—CAPTURE OF ALBATROSSES—REACH SAN CARLOS—VEGETATION; CITHAREXYLON; FUCHSIAS; ESCALLONIAS; MYRTLES—HUMMING-BIRDS—OYSTERS—FERNS—LIZARDS—BIRDS—LORANTHUS—FOXGLOVE—VISIT THE TOWN OF ANCUD—CHILIAN NETTLE—SCISSOR-BILL—CONCHOLEPAS—PORCELLANA—BAD WEATHER—MARINE ANIMALS—EGG OF CALLORHYNCHUS.

Our work to the north-eastward of Sandy Point was now concluded; and as, owing to the amount of sounding necessitated at the eastern entrance of the Strait, our stock of fuel was running low, Captain Mayne determined on proceeding northwards by easy stages to the island of Chiloe, on the west coast of the continent, whither a vessel had been appointed to meet us with the necessary supplies in the beginning of April. Accordingly, between four and five P.M. on the 9th of March, we bid farewell to the settlement for the season, and proceeded south-westwards as far as Port Famine, where we anchored for the night, in the hope of procuring sights next day; but on the morning of the 10th, although it was fair, the sky was covered with a dull gray mantle, which held out no hopes of the sun being able to break

through it, and we therefore continued on our westerly course, without having accomplished the desired object. In the course of the forenoon we encountered three canoes occupied with Fuegians, who, as usual, came alongside in the most noisy manner, shouting, grinning, laughing, and waving skins over their heads. The greater number were possessed of the customary short seal-skin cloaks, but one woman was totally naked. Several had ornamented their faces with coloured red or white lines, extending along the bridge of the nose, and one man had coloured his lank hair brick-red with some pigment, which did not add to the charms of his appearance. Being anxious to pass on, we did not waste time in parleying with these people, and they did not attempt to follow us as we moved on. The day was fine, the character of the region considered, so that we were able to appreciate the magnificent scenery on either side of us as we passed along, and we reached Fortescue Bay at six P.M., too late to make it worth while to go on shore. Next morning we again moved onwards. Much rain fell during the day, but occasional bright gleams displayed various fine glaciers, and snowy mountain summits. We entered Playa Parda Cove about five P.M., and as there was still about an hour's daylight, two of the officers and I, having encased ourselves in mackintoshes and sea-boots, left the ship in the pouring rain, landing at the head of the harbour, and scrambling over the steep banks, close to where two fine cataracts came rushing tumultuously down the mountain-side. Our researches were rewarded with a considerable number of plants, some of which were well known to us, while others had apparently not been previously recorded from the Strait. The principal were a low tree with quinate green leaves, which I subsequently found in many localities

to the westward, as well as throughout the Channels, and which appears to be a species of *Panax* or some allied genus; a Myrtaceous shrub, the *Metrosideros stipularis*, which seems not to have been observed previously to the south of the Chonos Archipelago, but which I subsequently ascertained to be extremely abundant on both sides of the western portion of the Strait, and throughout the Channels of western Patagonia, forming an elegant low tree, with a red bark, small dotted leaves, and pretty white flowers; *Escallonia serrata*, out of flower; *Pernettya mucronata*; *Libocedrus tetragonus*, here existing as a low shrub; *Callixene marginata*; *Tapeinia Magellanica*; *Myrtus nummularia*; a curious little *Caltha*, the *C. dionæfolia*, which grows in low firm bright green clumps or bosses; *Lomaria Magellanica*; *Gleichenia acutifolia*; and two species of *Hymenophyllum*, *H. tortuosum* and *H. pectinatum*, the last of which had not been previously recorded to the south of the Chonos Archipelago, although it is very common in the western part of the Strait, and throughout the entire extent of the Channels.

Next morning (12th) we left Playa Parda, and proceeded westwards amid frequent showers of heavy rain, reaching Sholl Bay, on the western side of the southern extremity of Smyth's Channel, between three and four P.M. Here we anchored, and shortly after, landing with two of the officers, had a walk, or rather scramble, over the country in the neighbourhood, the aspect of which struck us as singularly gloomy and desolate, as seen under a sky black with thick clouds, which descended at short intervals in tremendous showers. The bay is bounded by a tract of low ground covered with a thick vegetation of stunted trees of evergreen beech, Winter's-bark, and *Libocedrus tetragonus*, together with a sprinkling of the *Panax* mentioned above, and

a variety of low shrubs. Behind this stretches an extensive tract of elevated and boggy land, abounding in patches and tarns of fresh water, certain of which are united in chains by rapidly-flowing streams, and are large enough to merit the designation of small lakes; and this is in its turn succeeded by a range of steep, rugged, gray hills, with sharply-defined summits. We found that the whole surface of the country was drenched with moisture, a circumstance that made a strong impression on us at the time, but which we subsequently learned was the normal condition of the whole of the land bounding the western part of the Strait and Channels. In the course of a fatiguing scramble through the bushes and over the boggy ground, now and then sinking up to our knees in holes, we found that the vegetation was much the same as that at Playa Parda. On the shrub-covered ground *Desfontainea* and *Philesia* abounded, together with a variety of plants of humbler growth, including the two species of *Hymenophyllum* previously procured, *Callixene marginata*, *Acæna pumila*, *Gaultheria antarctica*, *Myrtus nummularia*, *Festuca Fuegiana*, etc.; while the surface of the bogs was covered with a dense coating of *Gaimardia*, *Caltha dioneæfolia*, and *Astelia*, together with species of *Sphagnum* and other mosses. The *Astelia*, a plant referred by some botanists to the *Juncaceæ*, and by others regarded as the type of a distinct order, is extremely abundant throughout the boggy country of the Channels and the western portion of the Strait. The flowers are white, about half-an-inch in diameter, and have a very pretty appearance when viewed *en masse*. In the pools of water a Juncaceous plant (*Rostkovia*) was abundant, and attracted our attention by its curious habit of growth, the leaves arising at regular intervals in single file from the creeping soboles, which intersect the pools

in all directions, so as to divide them into a number of angular spaces. A single specimen of another plant, the *Tetroncium Magellanicum*, afterwards found in many other localities, was procured on this occasion. The evidences of animal life were scanty in the extreme. Among the few birds observed were examples of the common duck of the Strait, a hawk, a snipe, and a bluish-black bird, which appeared to be a coot or water-rail. On the beach I picked up a few dead shells, including a Volute, and some specimens of *Apollon Kingii* and *Chione antiqua*.

We left the shore between five and six P.M. to return to the ship, observing on the way a Fuegian canoe emerging from a creek not far off, which, shortly after we got on board, came alongside. It contained thirteen inmates, including men, women, and children, chattering, grinning, and shouting "tabac." Their clothing was of seal or otter skins, sewn together so as to form cloaks worn with the hair innermost, reaching from the shoulders half-way down the thighs, and gathered in at the shoulders and lower part of the loins. They stooped very much, and in general had very protuberant abdomens, and the breasts of the women hung down in a remarkable manner. Their hair was cut short on the crown of their heads, but elsewhere was long and lank; and while they appeared to have no traces of whiskers, a few black bristles were to be seen on their chins and upper lips. The eyes were dark, the sclerotic had a decidedly yellow tint, and the conjunctiva of most of the adults was very red and inflamed-looking, the result of the smoke. Their teeth were not by any means so good as those of the Patagonians. As usual they possessed a smouldering fire of green wood in the bottom of the canoe, on a bed of clay. They did not appear to be at all suspicious of us, and on our signing to them to

come on board, the three men of the party at once climbed up the side of the vessel. It was interesting to notice the variety of physiognomy presented by the three, the youngest of whom had a very pleasant, intelligent countenance, and appeared very good-humoured, smiling and laughing perpetually. All three exhibited much curiosity about the various fittings of the ship. They knew one or two English words, requesting "pipe" from us, and remarking, on feeling the heat coming up from the engine-room, "fire." They appeared greatly amused by seeing the reflection of their faces in the chart-room windows. We were much struck with their talent for mimicry, as they repeated English words and short sentences with the utmost accuracy. This property is possessed by all these people, and constitutes *the* great source of difficulty to be encountered in attempting to learn anything with regard to their language. We frequently, on subsequent occasions, pointed to various articles, naming them in English, in the hope that they would give them the equivalent appellation in their tongue, but generally quite in vain, as they would merely repeat what we had said, with the greatest exactness. This party left us after spending about an hour on board, returning to a spot on the beach where we had noticed some rude beehive-shaped wigwams, formed of boughs stuck into the ground in a circle, with their upper ends bent inwards and fastened together in the centre so as to form a frame-work, which is temporarily roofed in, when in use, with green branches.

As during this and the ensuing season we had various interviews with these people, it may be well here to offer a few remarks on the little that is known regarding them; and I may state at the outset that I think there can be no manner of doubt that, though occurring on the west coast of Pata-

gonia, they form a branch of the Fuegian race, resembling the other tribes to be met with farther south both in their language and mode of life. They extend throughout the Channels from the Gulf of Peñas to the Strait of Magellan, where they appear to be replaced by a closely allied tribe, the "Pecheray" Indians of voyagers. Fitzroy, when in command of the well-known survey of the southern parts of South America, in which Mr. Darwin was associated with him as naturalist, did his best to collect all the information that was available to him concerning the aborigines of Patagonia and Fuegia, and has methodised it in two interesting chapters in his valuable narrative of the "Beagle's" cruise. He there recognises six tribes, all of which appear to belong to the Fuegian stock, and these he names the Yacana, the Tekeenica, the Alikhoolip, the Huemul, the Pecheray, and the Chonos or Channel Indians. To the Yacana, or inhabitants of the northern portion of the large eastern island of Tierra del Fuego, I have had occasion to refer several times, in the account of our work in the eastern part of the Strait; and I would merely reiterate the remark that they appear to be a very distinct tribe from any of those encountered by us to the westward, inhabiting a district similar in its climate, features, and productions, to the plains of Eastern Patagonia, and resembling the Patagonians in their stature, dress, and general mode of life. The second tribe, or Tekeenica, are natives of the south-eastern portion of Fuegia, according to Fitzroy, who states that they are "low of stature, ill-looking, and badly proportioned;" that "their colour is that of old mahogany, or rather between dark copper and bronze;" and that "their rough, coarse, and extremely dirty black hair, half hides, yet heightens, a villanous expression of the worst description of savage features." It is, I believe, to the civilising and christianising of this tribe in

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FUEGIAN INDIANS. - WESTERN CHANNELS.

especial, that the philanthropic efforts of the South American Mission, under the superintendence of the Reverend Mr. Stirling, now Bishop of the Falkland Islands, have been hitherto chiefly directed; and that their labours have been attended with a wonderful amount of success, the interesting reports from time to time published by that mission place beyond a doubt, affording a striking proof that there is no nation, however low in the scale, upon whom the truths of Christianity may not be brought to bear with the most admirable result. Avoiding the errors of their predecessors in the same field, the agents of the mission no longer, if I am not mistaken, endeavour to civilise these people in their native regions, but transport them to a station which they have established in Keppel Island, one of the smaller members of the Falkland group, where the drier and generally more favourable climate permits, to a certain degree, of the cultivation of the soil. The third tribe, or Alikhoolip, according to Fitzroy, occur to the westward of the Tekeenica, between the western part of the Beagle Channel and the Strait of Magellan; and he observes that they are the stoutest and hardiest of the south-western tribes, resembling the Tekeenica in general appearance, but superior to them. To a tribe met with between the Otway and Skying waters, but whose name he could not learn, Fitzroy gave the name of "Huemul," for the rather unsatisfactory reason that they possessed "many skins of a kind of roebuck," which is said to be the animal described by Molina as the Huemul. The fifth tribe, or Pecheray, are inhabitants of both sides of the western part of the Strait of Magellan. We had frequent opportunities of observing them, in addition to the inhabitants of the Channels; and I think most of us were agreed that, with the exception of their canoes being constructed of five pieces of bark instead of five planks, as is

generally the case with those of the Channel Indians, and that they were upon the whole more degraded and repulsive-looking than those people, there was nothing to distinguish the two tribes in a marked manner, their language and mode of life being much the same. Of the numbers of these tribes it would be very difficult to form anything like an accurate estimate, owing to their wandering habits. Fitzroy estimates the Tekeenica as 500, the Alikhoolip as 400, the Pecheray as 200, the Huemul as 100, and the Channel Indians as 400; but as he does not furnish us with the data necessary for arriving at these conclusions, they may be considered as but of very doubtful value. None of the tribes encountered by us appeared to have any fixed place of habitation, but travelled about in their canoes from place to place, in search of the shell-fish which constitutes their principal diet. The Channel Indians have received the name of Chonos, from the belief that they form a remnant of the tribes once inhabiting the Chonos Archipelago, but driven out at the time of the Spanish conquest. This may very possibly have been the case, but I am not aware that there is any unimpeachable authority for the statement; and it appears to me more probable that the Channel Indians, in common with the other southern Fuegian tribes, have gradually migrated southwards at a much more distant period, in consequence of having been evicted from their original territory by more powerful aboriginal nations. Of the beliefs and ceremonial rites of these people our knowledge is very limited. Fitzroy states, on the authority of Mr. Low, a sealing captain, who had much intercourse with the Channel Indians, that they are "by no means without ideas of a superior Being. They have great faith in a good spirit, whom they call Yerri Yuppon, and consider to be the

author of all good; him they invoke in time of distress and danger. They also believe in an evil spirit, called Yaccyma, who they think is able to do all kinds of mischief, cause bad weather, famine, illness, etc.; he is supposed to be like an immense black man." He also informs us that, according to Mr. Low, they appear to have regular places for depositing their dead, caves being sometimes made use of for the purpose. I greatly regret that, despite a most diligent search for Indian graves in all those localities visited by us, I never succeeded in meeting with any, either of those of the Channel or the Magellanic tribes. The latter are said to carry the corpses of their deceased friends a long way into the woods, where they lay them upon broken boughs or pieces of solid wood, and then pile a great quantity of branches over them. This, according to Fitzroy, is the course pursued alike by the Tekeenica, Alikhoolip, and Pecheray.

For more minute information regarding the manners and customs of these people, I must refer the reader to Fitzroy's interesting narrative, as well as to the reports of the South American Mission.

On the morning of the 13th of March the survey of Sholl Bay, begun on the afternoon of the previous day, was designed to have been carried on, but tremendous rain fell without intermission throughout the day, with occasional furious squalls by way of variety, and we were all confined to the ship, where we felt rather rueful as to our prospects, for though we had heard various reports of the rainy character of the region where our work for some time to come lay, we had not pictured anything quite so bad, or so utterly dreary, as we were now encountering. We had no awning at this time, and it was therefore almost impossible to take

exercise on deck, as clothes once wet in this climate are not easily dried on board ship ; and we looked back with a decided feeling of regret to the dry and sunny, albeit windy weather, of which we had such a long experience in the east. Matters were, however, considerably improved on the 14th, for though heavy showers fell throughout the day, there were some brief intervals of watery-looking sunshine. The Indians paid us a second visit in the forenoon, and remained some time, walking about the deck, and taking very careful note of everything they saw, but without helping themselves to anything. The women left in the canoe were very clamorous for "Galleta" (ship-biscuit), endeavouring to make us understand that they wanted it for their children. One boy, about ten years old, was exceedingly observant and intelligent, and would have proved, I have no doubt, a most promising subject for education. They were greatly amused with two little pigs which we had on board, and which were let out of their den on this occasion, running after them, trying to catch hold of them, and giving vent to peals of the most hearty merriment. One of the men was presented with a shirt, trousers, and a marine's old red jacket, by some of the ship's company, and walked up and down in his new attire with his hands in his pockets. Some of the women wore necklaces formed of numbers of a small shell, *Margarita violacea*, common in the Strait and Channels, strung together on fibres of sinew, and one of the men had a fragment of rock-crystal suspended round his neck, while another had a necklace formed of the bones of a bird's foot. Both sexes wore a narrow band, apparently formed of hide, round each ankle. In the afternoon a small party of us landed for a ramble, one of the officers taking his gun with him for the purpose of endeavouring to secure a specimen of

a kelp-goose, *Chloephaga antarctica*, several of which were to be seen on the rocks about the bay. This beautiful bird, of which the adult male is snow-white, and the female nearly black, presenting a most striking contrast when standing together, we found common throughout the western part of the Strait, and on the west coast of the continent as far north as Chiloe. It never goes in large flocks, rarely more than five or six being to be seen in company at a time, and generally but a solitary pair to be observed on one spot. As a rule, we found them exceedingly wary, probably in consequence of being often disturbed by the Indians, who occasionally kill them. Their flesh is quite uneatable at most seasons of the year, owing to the nature of their food, which consists of Molluscs and other marine animals. On landing on this occasion, we in the first place walked for some distance along the edge of the beach, immediately above which extended a splendid hedge of an arbutus-like shrub, the *Pernettya mucronata*, which attained a height of upwards of eight feet, and was covered with little waxy-white, bell-shaped blossoms, as well as numerous bushes of *Escallonia serrata* nearly out of bloom. While we were thus engaged, a tiny humming-bird, *Trochilus forficatus*, made its appearance, flying about over the flowers, and seeming in strange contrast with the gloomy nature of the climate. We often saw specimens of it in the Channels subsequently; and I believe it extends to the southern extremity of Fuegia, while northwards, if I am not mistaken, it ranges as far as Peru—thus passing through every variety of climate, from an intensely humid cold region to a tropical one where rain hardly ever falls. On ascending to the higher ground in search of plants, we found many stout bushes of *Metrosideros*, which afforded us a shelter, not to be despised, during the occurrence of heavy showers. I found one or

two additional ferns, species of *Hymenophyllum*, on this occasion, but, with this exception, met with nothing that was of a novel character.

The 15th was another day of very heavy showers, with now and then brief gleams of sunshine. Our Fuegian friends, this time no less than nineteen in number, again favoured us with their company, most of the adults coming on board, with the greater number of their children, and one bringing a rude axe to be sharpened on the ship's grindstone. They appeared to consider our custom of walking up and down the quarter-deck, two and two, as a most amusing proceeding, one of the women imitating the rhythm of the sound produced by our feet as we advanced and receded, and some of the men, after a time, following our example ;—one old gentleman, blind of an eye, marching in front of Captain Mayne, who laid his hand on his shoulder, and gave him a slight shove to one side, an action which was immediately retaliated, apparently under the impression that it constituted part of the ceremony. The height of two of the men and two of the women was measured on this occasion, that of the former being found to be five feet six and five feet three inches, and that of the latter four feet ten and four feet seven. They did not appear nearly as tall as this, however, as nearly all of them were much bent, probably in consequence of their spending so much of their time in crouching round their fires. While the party were on board they moored their plank canoe alongside of the ship by means of a rope of plaited rushes (*Rostkovia*). One circumstance connected with them, which we were interested to observe, was, that though fond of tobacco-smoke, which they inhale till they almost lose consciousness, they do not appear to have yet acquired a predilection for intoxicating liquors, as one individual to whom a little rum

Philesia buxifolia

Grammitis australis

was offered, on tasting it, spat it out with disgust. Coffee, on the other hand, met with great appreciation.

On the morning of the 16th, when the dredge was hauled in, two fine specimens of an elegant long-spined *Echinocidaris*, the *E. Schythei* of Philippi, afterwards obtained by us in several other localities, were procured. We left the bay early in the day, and proceeded northwards through Smyth's Channel. A more gloomy and desolate region than that through which we passed can hardly be conceived; intensely rugged rocks and low hills, sustaining no vegetation higher in the scale of life than lichens and mosses, on either side ; beyond, savage gray mountains partially shrouded in mist ; and above, a sky covered with a mantle of black clouds, which descended at short intervals in torrents of rain ;—the whole combining to produce a most depressing influence on our feelings, and forcibly recalling to my remembrance Bunyan's famous description of the valley of the shadow of death. Between three and four P.M. we reached the Otter Islands, a group of small islets densely covered with a stunted vegetation composed principally of the evergreen beech, Winter's-bark, and "Cipres" (*Libocedrus tetragonus*), and there anchored for the night. Soon after I landed, and spent an hour on one of the islands, obtaining for the first time specimens of a curious little fern, with an undivided frond (*Grammitis australis*), which I subsequently met with in numerous localities in the Channels, and western portion of the Strait. It generally grows on the trunks of the trees in tufts, and its narrow fronds vary in size from two to five or six inches in length, by a sixth to a fourth of an inch in breadth. It is a very rare occurrence, I may here observe, throughout this region of almost perpetual rain, to find a tree which has not its bark almost entirely covered with lichens, mosses, *Jungermanniæ*, and ferns (*Hymenophylleæ*

being the prevailing forms among the last mentioned); and the trees frequently grow so thickly together that we often, when on shore, walked considerable distances on the low branches and prostrate trunks at a height of several feet from the ground—an experience likewise recorded by the old navigator Sarmiento in his account of these parts.

On the beach of this island I picked up some dead valves of a large *Pecten* which I had not seen before, and which made me hope to procure live specimens in the dredge, but in this I was disappointed. We intended to have moved onwards on the 17th, but rain fell in torrents throughout the day, concealing the land from view to such an extent as would have rendered it very difficult, if not impossible, for us to thread our way through the various intricate passages which lay before us, and we accordingly remained at anchor. On the 18th the weather had greatly improved, rain falling but slightly; and though there was a very cloudy sky overhead, the sun occasionally shone out brightly for a few minutes, and we began to hope that the climate was not quite so bad as we had at first supposed. We left the Otter Islands in the morning, and passed northwards, entering the Sarmiento Channel, where, after a prolonged but unavailing search for a suitable anchorage, we halted in a small cove in Piazzi Island at six P.M., and there remained for the night. We passed through some very fine rugged scenery this day, noticing many remarkable mountain-peaks, and gaining a view for a short time of a magnificent glacier of great extent. Next morning we continued our northerly course, rain descending in floods without intermission during most of the day; and about five P.M. we anchored in Puerto Bueno, a fine harbour on the coast of the mainland in the northern part of the Sarmiento Channel. Here there were

more signs of life than had been seen since we left Sholl Bay, a good many steamer-ducks being startled on our approach, and a kingfisher observed flying about the harbour.

The morning of the 20th, when we left this port, was fine, and a bright, clear, calm day followed, which allowed us fully to appreciate the glorious scenery on either side of us as we steamed onwards. The nearer hills rose sheer out of the water, clothed nearly to their summits with trees displaying a fine variety of shades of green, while the more distant had their peaks capped with snow; and the gorges of many were occupied by extensive glaciers, the dazzling white of whose upper surface contrasted finely with the splendid blue and green tints exhibited by the crevasses, and the general outline of some suggesting a stormy sea suddenly frozen into repose. Early in the day, as we approached the entrance of the Guia Narrows, a party of Indians paddled up to us in their canoe. There were five adults present, all of them apparently of the male sex, and they struck us as larger in stature, more muscular, and with plumper faces, than our friends at Sholl Bay. They had their faces painted red and white, and one had a cap seemingly formed of the white breast-plumage of a cormorant. Late in the afternoon we saw one or two miniature icebergs rising out of the water, and shortly before six P.M. we passed the entrance of a beautiful winding inlet, with snowy hills in the distance. As we did not succeed in finding a suitable anchorage, and the weather continued fine and settled, Captain Mayne decided on proceeding onwards all night. When the sun set, a sensation of sharp cold became most distinctly perceptible, and we glided quietly on our way through the still frosty night, the steep mountains on either side presenting a singular and ghostly appearance to the view.

Early next morning (21st) I was roused by hearing

shouts from the look-out man, of "Ice on the starboard bow," "ice on the port-bow, "ice right ahead," repeated at short intervals, and presently the bows of the vessel came in contact with a large fragment with a force that made her shiver. A little later the officer of the watch sent to let me know that we were surrounded by masses of ice, and on going on deck the spectacle presented was very remarkable. We were now passing the entrance of Eyre Sound, and the water all around us was studded with large blocks of ice, some many yards in extent, derived from the glaciers of the Sound, and now illuminated by the beams of the rising sun, their submerged portions appearing of a vivid green tint, while those above the water were dazzling white. It was a fine frosty morning, followed by an even more beautiful day than the preceding, and we had an endless succession of the most lovely views of densely wooded islets, winding inlets, and snowy mountains. We noticed many ridges that were knife-like in their sharpness, and at one place a peak which presented almost an exact representation, on a smaller scale, of the famous Matterhorn. In the course of the forenoon several large whales were seen not far from us, one of which, when preparing to make a dive, lifted the characteristic tail-fin several feet out of the water. They were blowing vigorously, the sound produced, as usual, resembling a loud sigh. We also observed numerous seals gambolling about in the water, and a number of gulls, cormorants, and penguins, as well as a couple of vultures, perched on a low island. Between ten and eleven A.M. we anchored in Eden Harbour, at the head of Indian Reach, and immediately to the south of the English Narrows, to allow of sights being obtained; and two of the officers, with myself, at once landed for a ramble. We spent about an hour and a half on shore very pleasantly, the sun shining brightly

and diffusing a wonderfully genial heat. We saw several humming-birds and kingfishers; and I was greatly interested by the discovery, on the part of one of my companions (Dr. Campbell), of a minute frog, striped with narrow longitudinal bands of purplish black and pale primrose yellow, and with the under surface of the feet of a pale vermilion colour.* Several plants were also obtained for the first time, and among these a fine Coniferous tree of the tribe *Taxineæ*, the *Podocarpus nubigenus*, which I afterwards found to be common throughout the Messier Channel, as well as at Port Otway, in the Chonos Archipelago, and at Chiloe. Hitherto, I believe, it had not been met with to the south of the Chonos Archipelago. A second discovery was that of a curious little dwarf conifer, forming a low undershrub, with decumbent branches thickly covered with small scaly imbricated leaves, and which was extensively distributed over the low ground near the landing-place. I could not then succeed in finding any specimens in fruit, and did not know, till I had the pleasure of meeting Professor Philippi at Santiago about six months later, that it was the *Lepidothamnus Fonki* described by him from specimens obtained in the mountains of Valdivia and the Chonos Archipelago, at a height of about 2000 feet. The following season I found that it was extensively distributed throughout the Channels, extending as far south as Mayne Harbour, in one of the Owen Islands (Sarmiento Channel). Owing, I suppose, to the difference of latitude in the Channels, it does not there appear to attain such an altitude, extending from the sea-level only to an elevation of 500 or 600 feet. It does not occur in the Strait of Magellan, and I did not observe it at Port Otway (peninsula of Tres Montes);

* This little creature afterwards proved to be the type of a new genus, to which Dr. Günther has given the name of *Nannophryne*.—*Proc. Zool. Soc.* 1870, p. 401.

but there I did not ascend to any considerable height. The male amenta are of a fine purplish plum-colour when fresh. A third novelty was the *Mitraria coccinea*, a shrub with a scandent habit, common in Chiloe and the Chonos Archipelago, but, I believe, not previously found south of the Gulf of Peñas. With its dark green, glossy, ovate-acute leaves, and scarlet tubular flowers, it presented a very beautiful appearance. *Fuchsias* and *Despontaineas* were also very plentiful, their bright-coloured blossoms illuminating the edge of the woods; and a variety of other plants were met with, one beautiful little moss, the *Hypopterygium Thouini*, specially exciting our admiration from the resemblance it bore to a miniature palm in its habit of growth—the branches, clothed with minute leaves of a most lovely green, spreading at right angles from a stem one to two inches high.

When the sight-party had accomplished their object, we weighed, and passed through the English Narrows at four P.M., anchoring in Halt Bay, a narrow cove surrounded by high steep hills, thickly covered with the usual vegetation. Immediately after a small party of us borrowed the ship's dingy, and set out on a cruise in the neighbourhood, landing on various islands and points of land. It was a perfectly still afternoon, and it has seldom been my lot to witness any scene more serenely beautiful than was afforded by the wooded hills bathed in sunlight, and the placid surface of the water, which reflected the blue sky with its delicate clouds, and the trees growing at its margin. The vegetation, we found, was very similar to that of Eden Harbour, being chiefly composed of Winter's-bark, evergreen beech, *Libocedrus*, and *Metrosideros* (which last is one of the few trees that, as a rule, has the bark free from parasitic Cryptogamia), together with fine specimens of *Podocarpus nubigenus*. A low tree, not observed

previously, was tolerably abundant, and attracted our attention from the peculiar character of its pinnate leaves, the joints of the petiole of which were winged in a rhomboid manner. This was the *Weinmannia trichosperma*, one of the *Cunoniæ*, and common at Chiloe, where we afterwards saw it. Like other plants already mentioned, it does not appear to have been previously recorded south of the Chonos Archipelago. I also picked up the branch of another tree that was new to me, but of which I did not succeed in finding the owner on this occasion—namely, the *Lomatia ferruginea*, one of the *Proteaceæ*, common also at Chiloe, but also not previously recorded to the south of the Gulf of Peñas. The following season I traced it throughout nearly the entire extent of the Channels, though I did not observe it in the Strait of Magellan. In comparatively open spaces in the woods, *Lomaria boryana* was growing in the utmost luxuriance, presenting a striking resemblance to a dwarf palm or cycad; and many other Cryptogamia were met with, including, among others, a *Hymenophyllum*, with a long narrow deeply-cut hairy frond, which I had not seen before. *Mytili* (*M. Chilensis*) of large size abounded on the rocks, and were pronounced to be excellent by those who partook of them; and a few specimens of a small crab, the *Trichodactylus granarius*, afterwards found in great abundance at Chiloe, were also captured.

The 22d was another glorious day. We left our anchorage in the morning, and pursued our way through the Messier Channel, the perfectly calm surface of the water of which presented a lake-like appearance; while the mountains on either side rose sheer out of it, clothed with trees from the edge to a height of upwards of a thousand feet, with numerous cataracts rushing foaming down their sides, some appearing as threads of silver, while others were concealed from view by the thick-

ness of the vegetation, till they poured their waters into the Channel. Shortly before noon a canoe was observed pulling off to us, and, as she drew near, we stopped to let her come alongside. Her occupants consisted of a woman, partially clothed, who steered; a man who had his head and part of his body whitened with some pigment, and whose attire consisted of an apron of goose-skin, and an old waistcoat which did not meet in front; two youths, who sat near the bows and paddled, one entirely destitute of clothing, and the other with a piece of cloth about a foot and a half square on his shoulders; a girl, apparently ill, wrapped up in seal-skins; a little child, and two dogs with erect ears and stiff wiry hair. They approached us with the usual noisy demonstrations, and were presented with some biscuit and tobacco, after which we moved on, while they paddled off to the wooded shore. We passed out of the Messier Channel into the Gulf of Peñas between five and six P.M., and the retrospect was very striking; the high rugged hills on either side of the entrance of the Channel, many of them of the most wild and fantastic forms, appearing like the portals of a gateway, and becoming flooded with a rich deep purple tint as the sun went down. On this day the unpleasant discovery was made that, owing to our supply of coal being much less than was supposed, we would be obliged to make the voyage to San Carlos, Chiloe, under sail alone. The screw was accordingly got up as soon as we were clear of the land, and soon after the wind headed us, and, as we encountered an extremely heavy swell towards the entrance of the gulf, and the vessel was very light owing to the small amount of coal, she pitched in a most unpleasant manner, prostrating, without loss of time, all those of our number who were liable to sea-sickness, as well as many who in general experienced a complete immunity from that malady.

Under these circumstances we made very little way during the 23d, and matters were but little improved on the 24th—the wind and swell continuing with unabated force, and causing us to roll about very uncomfortably in the trough of the sea, while albatrosses sailed about the vessel in numbers.

A favourable wind, however, sprang up at length soon after noon on the 25th, and freshened steadily, so that by eight P.M. we were making upwards of nine knots on our course. That night there was a magnificent display of phosphorescence. It was very dark, and, as the vessel sped on her way, she threw out from her bows broad waves flashing with light and sparkling with brilliant stars. On the 26th the wind gradually fell, and there was a very heavy swell; but by the morning of the 27th the sea had gone down, and it was nearly dead calm throughout the day, and beautifully bright and warm. A most remarkable spectacle was furnished by the flocks of albatrosses (*Diomedea exulans*), which were peacefully resting on the calm surface of the water around the ship. Though the appearance of these birds when on the wing is very fine, they look singularly awkward when swimming, their great heavy heads, and large strong beaks, suggesting a child's first attempts at drawing water-fowl. At one time about twenty of them were close astern of us, growling hoarsely as they fought over the garbage thrown overboard from time to time. Several were taken on baited lines, and hauled in with considerable difficulty, as they struggled most vigorously, aiming violent blows at their captors with their powerful pinions. Some disgorged what they had been feeding on, which consisted principally of large Cephalopods of the genus *Ommastrephes* or *Loligo*. I killed two specimens with the aid of chloroform, the skin of one of which I afterwards preserved, and several more were

slaughtered by the ship's company for the sake of certain of their wing-bones (the radii) which are held in much esteem for pipe-stems. The largest captured measured ten feet nine inches in expanse of wing, while that which I preserved was somewhat smaller. Attached to the leg and pubic bone I found a well-defined superficial muscle, which does not exist in most of the swimming birds examined by me. Some beautiful Acalephæ were observed in the water close to us, and we put over the towing-net to endeavour to secure specimens, but were obliged to haul it in again almost immediately, as the albatrosses made an assault on it, and nearly tore it to pieces.

Early on the morning of the 28th land was sighted, and about half-an-hour before noon we entered the port of San Carlos de Ancud, situated at the northern extremity of the island of Chiloe. We anchored at first off the town of Ancud, but in consequence of information received by Captain Mayne from the governor, to the effect that the anchorage was not accounted safe during the prevalence of certain winds, we removed some hours later to Punta Arenas, a much more sheltered position, about two miles further into the bay. The aspect of the surrounding country, as seen on that fine day, the first we were informed which the inhabitants of Chiloe had experienced during this season, was very attractive, there being a most agreeable mixture of woods and thickets, with cleared and cultivated patches here and there, surrounding dwellings, often built of a circular form, with high concavely-curved roofs, with projecting eaves, and which reminded one of the officers of houses seen by him in Japan. A party of us landed late in the afternoon, spending a couple of hours roaming about in the neighbourhood; and I was much delighted with the luxuriance of the vegetation, which was much more varied in its

character than that of the Channels. The tide was high when we went on shore, and close to the edge of the water extended a thick hedge of shrubs, from twelve to fourteen feet high, composed of Fuchsias and Escallonias (*E. macrantha*), both in full flower, together with an arboreous grass, the *Chusquea Quila*, which recalled the clumps of bamboos with which we were so familiar at Rio. A little farther from the beach a variety of species of *Myrtaceæ* prevailed, some of them covered with snow-white blossoms; and a tall shrub or low tree (*Citharexylon cyanocarpum*), with spiny branches clothed with small glossy dark-green veined leaves, and bearing clusters of splendid bluish-purple berries, was also very abundant. Several species of *Bromeliaceæ* also occurred, communicating a semi-tropical aspect to the scene, and one of these (*Bromelia bicolor*) presented a most striking appearance with its large tufts of long radiating spiny-edged leaves, the outer of which are dark green, while the inner are brilliant red, as if they had been dipped in arterial blood, surrounding a dense mass of flowers, varying from bluish-white to turquoise blue. The large rhubarb-like leaves (sometimes more than a yard in diameter) and dense spikes of small orange-red fruits of the "panke" (*Gunnera Chilensis*) speedily attracted our attention; and we collected many other plants which were new to us, including *Nertera depressa*, which covered the surface of the damp ground in many spots with its prostrate creeping stems and bright red berries; and a variety of ferns, such as the little *Asplenium trilobum*, the wedge-shaped fronds of which were plentiful on the tree-trunks; a *Goniophlebium*, also a tree-parasite with large oblong brilliant orange sori, and an *Asplenium* (*A. obtusatum*), with very stout pinnate coriaceous fronds, which grew in clefts on the rocks close to the sea. Numbers of a little humming-bird (*Trochilus forficatus*) were flying about the flowers, and

many hawks were observed perched on the branches of the trees, and giving vent to occasional harsh screams. The tide was too high to enable us to make a profitable examination of the beach, but we found the dead shells of several Molluscs which we had not previously encountered scattered about at high-water mark, together with fragments of a sand-burrowing Crustacean, the *Hippa talpoides*. We returned to the ship when the light failed us, finding those who had remained on board busily engaged in consuming oysters (*Ostrea Chilensis s. cibialis*) which abound in the port. It is a curious circumstance that Chiloe appears to be the only locality on the west coast of South America where this Mollusc occurs, and the more so, seeing that shells of an *Ostrea* abound in the recent tertiary beds of Patagonia and Chili.

The 29th was a beautiful day, a surprising circumstance, considering that we were in a climate where, according to a familiar saying of the inhabitants, it rains thirteen months out of the year. The atmosphere was very clear, enabling us to gain a splendid view of the snowy cone of Osorno, between 7000 and 8000 feet in height, together with the more distant Cordillera, which was also of a dazzling whiteness. It being Sunday we remained on board during the forenoon, and in the afternoon I landed with two companions, and had a very pleasant walk through the woods, which are formed of a considerable variety of trees, for the most part evergreens, and among which the Quillai (*Quillaja saponaria*), the bark of which, being rich in saponine, is extensively used as a substitute for soap, was one of the most prevalent. We observed some flowering specimens of an elegant species of barberry, the *Berberis Darwinii*, and were much delighted with the beauty of the ferns growing on the decaying trunks. Species of *Hymenophyllum* specially abounded; and we now saw for

the first time the beautiful undivided frond of the *Hymenophyllum cruentum*, which we afterwards met with at Port Otway and in the Messier Channel, as well as the handsome *H. caudiculatum*, the frond of which occurred sometimes nearly a foot in length. Another fern belonging to a different tribe, the *Lomaria aspera*, was common on the ground beneath the shrubs, and remarkable on account of the peculiarity of its habit, certain of the fronds lying flat along the surface of the soil, and taking root at their tips, so as to produce a new plant, from which arise a second series of fronds, which take root in their turn, a chain of plants, often many feet in length, being thus formed. After spending some time in the forest, we emerged from it to the cleared ground, and, seated on the bank of a stream near a large fuchsia bush, watched the humming-birds which were flying about the flowers in numbers, their heads gleaming as with burnished gold in the sunshine. We then walked for some miles along the beach, which is formed of rocks of rather hard yellowish sandstone, abounding in spherical nodules of more compact consistence, varying in size from an inch in diameter to the dimensions of a cannon-ball. At one spot we observed a collection of water-worn fossil trunks of trees, some of them evidently in the position in which they had grown countless ages before.

The following day was again very fine, with the distant prospect of Osorno and the Cordillera as clear as ever, and we began to consider ourselves in luck. In the morning a boat came alongside with a variety of articles for sale, including oysters and other shell-fish, and the fruits of the *Bromelia sphacelata*, esteemed by the Chilotes for their sweet taste, which somewhat resembles that of a pine-apple, and called by them "Chupon." There were also a few crabs, among which I observed the *Lithodes antarctica*, a large species of *Cancer*,

closely resembling our British edible crab, and one of the *Maiadæ*, the *Epialtus dentatus*, which ranges throughout the greater extent of the coast of Chili. It is ordinarily of a dull greenish colour, and possesses large strong claws, which, however, it does not readily employ as weapons of defence, being an animal of a sluggish disposition. I found it abundantly afterwards in the Bay of Arauco and at Coquimbo. The weather was so pleasant, that a party of five of us, the greater number bent on sport, left the ship early in the day in the dingy, and crossing over to the opposite side of the bay or creek, proceeded slowly along the coast towards the head of it; some of us landing, after a time, and walking along the beach. The sun was shining brightly, and the humming-birds were flying about in numbers, emitting a sharp chirping note, and occasionally fighting with each other. Many specimens of a beautiful lizard, the *Leiolæmus cyanogaster*, bright green above, and orange and blue beneath, were darting about, very difficult to secure, from the agility of their movements, and indulging in the inconvenient custom of parting with their tails on the shortest notice. We saw a flock of bandurrias (*Theristicus melanopis*), several kingfishers identical with the species occurring in the Strait and Channels, some rather large pigeons (*Columba Fitzroyii*), many black vultures (*Cathartes aura*), and brown hawks (*Milvago chimango*), which last were very annoying from their habit of screaming; large flocks of a small curlew (*Numenius Hudsonicus*), feeding on the mud-flats uncovered by the tide; some godwits (*Limosa Hudsonica*), spur-winged lapwings (*Vanellus Cayanus*), gulls, cormorants, steamer-ducks, and small grebes. Some pigeons, curlews, and godwits, with a single grebe, were shot, the last-mentioned bird being afterwards ascertained to be the *Podilymbus podiceps*. A variety of beautiful plants occurred

not far from the beach, and among these a Gesneraceous creeper the *Sarmienta repens*, was very conspicuous, covering the stems and branches of the trees with its curious fleshy round leaves and handsome scarlet flowers, which are about an inch long, with a dilated tube narrowed at either end and surmounted by five rounded small lobes. *Mitraria coccinea* also occurred in great luxuriance; and a plant of the mistletoe order, the *Loranthus tetrandrus*, widely distributed in Chili, formed large masses on many of the trees and shrubs—its narrow tubular flowers in many places forming a perfect blaze of scarlet. Another plant, not less beautiful but much more familiar, was our common foxglove, *Digitalis purpurea*, which seems to have become extensively naturalised in the north of Chiloe, though I never observed it in any of the localities visited by us at a later period in Chili proper. This day a barque, the "Alianza," bringing us supplies of provisions and coal from Valparaiso, arrived.

On the 31st I remained on board all day, busily occupied in preserving and stowing away specimens. Heavy rain fell during the most of the forenoon, but the weather cleared up later in the day. Captain Mayne, who had been absent at the town of Ancud, returned, bringing with him the cranium of a Chonos Indian, and three stone hatchet-heads from the Guaytecas Islands, given to him for my behoof by a Russian gentleman whom he had met. The hatchet-heads resembled closely in their details those of the aborigines of many parts of the world, hardly differing from ancient specimens of British manufacture, and thus affording a striking exemplification of the similarity which often prevails between the primitive implements of nations widely removed from each other. Another curious instance of "homoplastic" resemblance noticed by me soon after this was furnished by the primi-

tive Chilian plough, which hardly differs from that in use in Abyssinia at the present time.

On the 1st of April it rained heavily in the morning, but cleared up before long, so that early in the forenoon Dr. Campbell and I left the ship in the steam-cutter to view the town of Ancud, which we had not yet visited. On landing, our impressions of it were far from favourable, the aspect of things in general being dirty, squalid, and dismal in the extreme. The town contains about 5000 inhabitants, the native portion of which are for the most part stunted and miserable-looking, evidently possessing a considerable amount of Indian blood in their veins, and bearing no small resemblance to the aborigines of the Channels, although, of course, they are much more civilised than those people. They have very dark hair and complexions, and wear the Chilian national costume of a poncho over a shirt and trousers generally much the worse for the wear. Nearly all the houses are wooden, with steep roofs, often thatched, and displaying a deeply concave curve and projecting eaves; and as Ancud boasts a bishop, it also is endowed with a wooden cathedral. The streets are steep and very crooked, and paved with round stones most unpleasant to walk on, especially with thin boots. We called on an old Irish doctor who had spent twenty-one years in the settlement, and spent some time in talk with him, receiving a large amount of information on a variety of subjects, including frightful accounts of the rapacity and profligacy of the priesthood. After a visit to the club, of which we had been constituted honorary members, we set out on a walk into the country behind the town, following the meanderings of a winding road running between high green banks, on which *Rubus geoides* was flowering profusely, along with a little yellow *Oxalis*, *Potentilla anserina*, etc. On the roof-

trees of most of the cottages which we passed, hawks or vultures were perched, while great lean pigs, covered with long black hair, prowled about the doors, and miserable-looking curs barked at us till we were out of sight. We observed one field covered with foxgloves running to seed, and obtained a single peloric flower of the usual form. After ascending a rising ground which commanded a good view of the Pudeto Creek, and a stream of considerable size running into it, we retraced our steps to the town, which we left for the ship at five P.M.

The forenoon of the 2d was marked by the arrival of the mail with our letters, and the afternoon was devoted to botanising on shore, some additional ferns being procured. The 3d and 4th were fully occupied by most of us in writing letters to be despatched by the mail, a considerable number passing the afternoon of the latter day on shore. On this occasion I obtained several other plants, including a handsome species of Chilian nettle (*Loasa*), which revealed its nature in an unmistakable manner by severely stinging my hands when gathering it. We saw a single specimen of a scissor-bill (*Rhynchops melanura*) flying along close to the water, with its beak wide open, and the elongated under mandible as it were ploughing the surface. On the rocks on the beach I obtained for the first time a small live specimen of a remarkable Gasteropod, the *Concholepas Peruviana*, which adheres to its site with the firmness of a limpet, and several examples of a strong thick Turbinoid shell with a purplish-black epidermis, the *Chlorostoma atrum*. The former mollusc is widely distributed along the coast of Chili and Peru in the Laminarian zone, where it holds on with great tenacity to the rocks, and, being regarded as a delicacy, is much sought after as an article of food by the inhabitants of these countries, from

whom it receives the denomination of "Loco." I never succeeded in obtaining live specimens to the south of Chiloe, though on two occasions, on the following season, I found dead shells in the Channels; but there appears to be good evidence that at one time the species existed at all events as far south as the Messier Channel, as in Captain Stoke's narrative of his surveying cruise on the west coast of Patagonia, as given by King in the voyage of the "Adventure" and "Beagle,"* it is recorded that at Port Santa Barbara, island of Campanha, specimens "were found adhering to the rocks in great numbers." Stokes alludes to the shells as "used by the Magalhaenic tribes as drinking-cups;" and probably this is the true explanation of the occurrence of the two worn shells of the species found by me in two different localities in the Channels, and one of which was obtained at an old Indian camp. As there appears to be no evidence of the occurrence of the species in the Strait or Channels at the present time, it seems most likely that those employed in the manner mentioned by Stokes had been brought from a great distance by the Indian tribes in the course of their extensive wanderings. No reference to their employment by the Magellanic tribes is made by King, Fitzroy, Darwin, or any other voyager with whose narrative I am acquainted, with the exception of that of the ill-fated surveyor who states the circumstance. The *Chlorostoma* is also widely distributed on the coast of Chili—Port Otway (peninsula of Tres Montes) being the southernmost locality where I met with it.

In addition to these molluscs, I obtained on this day several other marine animals, including specimens of a rather large species of *Porcellana* (*P. tuberculifrons*) with very broad pincer-claws of a beautiful bluish violet colour, with

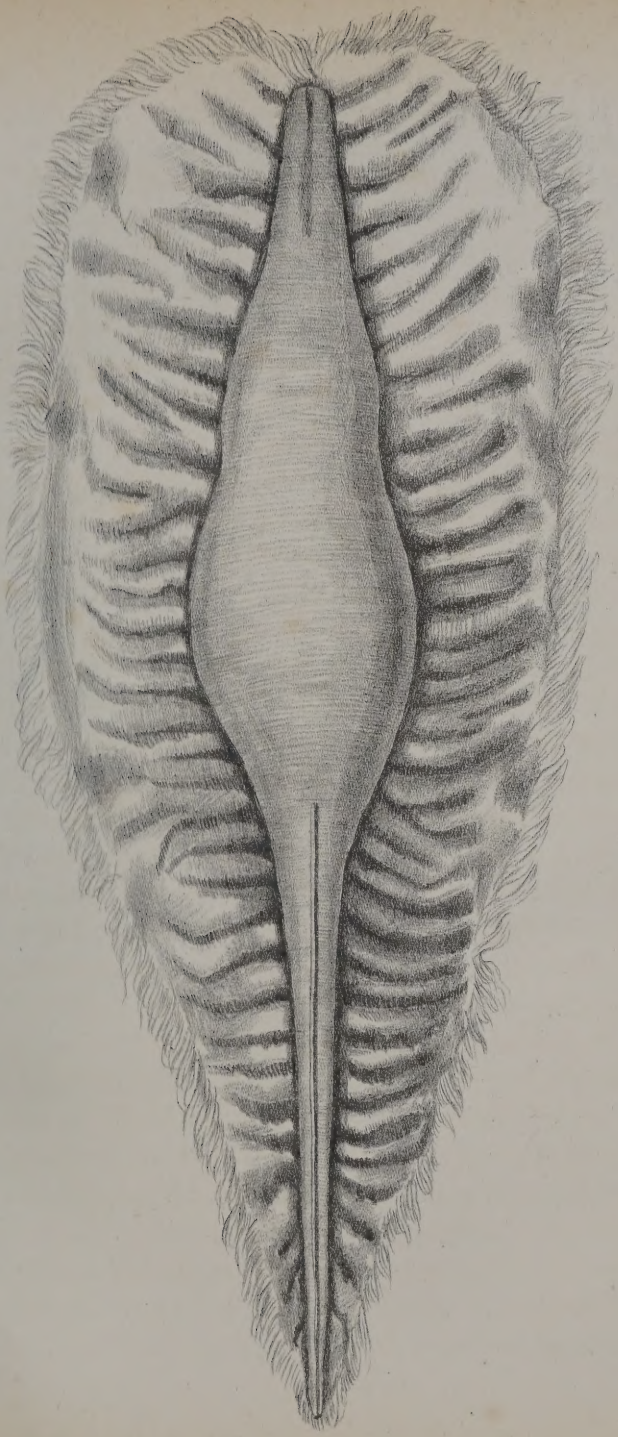
* Vol. i. p. 167.

which it dispensed on very slight provocation, and an Annelid with long pink tentacula, which existed in such myriads in burrows in the wet muddy sand, as to communicate a pale pink tint to it, which I at first supposed to be due to the presence of decaying Algæ.

Sunday, the 5th, was a most dismal day of wind and rain, but the weather was considerably improved on the 6th. On the forenoon of that day, in the course of skinning specimens of humming-birds obtained two days before, a more easy task than might be imagined, owing to their skins being strong and tough, though very greasy, I found a number of Tænioid worms in the abdominal cavity of one of them. In the afternoon, as the tide was low, a party landed to search for marine animals, and met with a considerable amount of success. Among the molluscs obtained were another live specimen of *Concholepas*, some fine *Fissurellæ* (*F. nigra*), *Calyptreæ*, and *Crepidulæ* (*C. dilatata*), several *Chitons* (*C. Bowenii*, *Chiloensis*, etc.), a Turbinoid shell with a thick calcareous operculum (*Amyxa niger*), a yellow *Doris*, and some fine simple and compound Tunicates. The Crustacea included a *Hippolyte*, and several crabs, such as *Xantho planus*, *X. Gaudichaudii*, *Epialtus dentatus*, and *Pilumnoides perlatus*; and a variety of Annelids and Sponges were also found. A little grebe, distinct from that earlier mentioned, the *Podiceps caliparius*, was shot, and from a seining-party which had been despatched from the ship I obtained a small Cephalopod (*Loligo Gahi*), a specimen of *Galathea subrugosa*, and two curious fish, one a little mailed species (*Agonus Chiloensis*), afterwards found at Port Otway, and the other a small specimen of the southern Chimæra (*Callorhynchus antarcticus*). The latter I often met with subsequently on the coast of South Chili, and it appears to be not uncommon at Chiloe,

as I found several specimens of its remarkable horny egg lying on the sandy beach near our anchorage. This protective structure bears a general resemblance in texture and appearance to the eggs of the rays and sharks, but differs from them considerably in form. It is of a dark greenish-black colour, and in general measures from eight to nine, or even ten, inches in length, by about three in breadth. It consists of a central, somewhat spindle-shaped convex area (between the horny walls of which the young fish lies), surrounded by a broad plicated margin, which is fringed at the edge, and covered on the under surface with fine light brownish-yellow hairs. The accompanying sketch will enable the reader to realise its curious appearance.

I was detained on board during the greater part of the following day, as I had a number of specimens to consign to my spirit-jars; but towards the close of the afternoon I landed, and had a short walk along the beach, finding many specimens of the small crab (*Trichodactylus granarius*) obtained at Halt Bay, under stones, where small streams of fresh water joined the sea. A scissor-bill was again seen, but was unfortunately not within range. The 8th, 9th, and 10th were in no way eventful. Having taken in our stores, and there being nothing else to detain us, we left the port of San Carlos on the morning of the 11th, to return to our work; but a southerly wind soon after sprang up, and freshened with such rapidity that about two P.M. we altered our course, and returned to Ancud, anchoring off the town at about six P.M. There was a very fine sunset that evening, the most brilliant we had seen for a long time past—the sky in these humid regions, even when the day has been sunny, becoming in general clouded over before evening.



Egg of Callorhyncus Antarcticus

CHAPTER XI.

LEAVE SAN CARLOS—OSCURO COVE—TRICUSPIDARIA—MUSSELS AND HUGE BARNACLES—PORT SAN PEDRO—PORT OTWAY—COLUMNEA AND OTHER PLANTS—CHIASOGNATHUS—OTTER—WHITE EGRET—FISH—MOLLUSCS—ECHINODERMS—CROSS THE GULF OF PEÑAS AND ENTER THE MESSIER CHANNEL—ISLAND HARBOUR—LARGE HELIX—HALT BAY—BARKING BIRD—PINGUICULA ANTARCTICA—EDEN HARBOUR—CHANNEL INDIANS—COLEOPTERA—RAINY WEATHER—HOSKYN COVE—TALL FERNS—TURKEY-BUZZARD—RETURN TO ISLAND HARBOUR—ASCEND A MOUNTAIN—CAMPSIDIUM CHILENSE—GALE—REACH CHILOE—TENOUN—HUITE—SMALL OPOSSUM—FROG—FUNGUS—CINCLODES PATAGONICUS—SCISSOR-BILL—RARA—NARROW ESCAPE FROM BEING WRECKED—LOTA—LAPAGERIA—EUXENIA—BOLDU—MARINE ANIMALS—COAL-MINE—TALCAHUANO—EXCURSION TO CONCEPCION.

THE 12th of April was a bright, clear, cold day, and in the morning we made a fresh start, hoping for better luck this time, as Captain Mayne had decided on this occasion to proceed southwards between Chiloe and the mainland, a course which possessed the great advantage of enabling us to make a portion of the voyage in smooth water. Passing through the Chacao Narrows, on the steep sandstone cliffs of which the great leaves of the *Gunnera Chilensis* formed a conspicuous object, we entered the Gulf of Ancud, and steamed slowly southwards along the east coast of Chiloe. The scenery, alike of the foreground and of the distance, was extremely pretty as viewed in the bright sunlight, there being a great variety of colouring in the foliage of the shrubs and trees,

while here and there a patch of pasture-ground occurred, or a tiny village peeped out through a gap in the forest. Entering a winding passage between the main island and the islet of Caucahue, we anchored at three P.M. in a beautiful sheltered nook (Oscuro Cove of the charts), and soon after several of us landed, and had a pleasant walk up to the head of the cove. The vegetation, as at Ancud, was chiefly composed of Myrtaceous shrubs, many of which were in bloom, and presented a very elegant appearance; but we also observed a few examples of a low tree which was new to us, and remarkable for the possession of handsome, solitary, drooping, bright crimson flowers, nearly an inch long, on elongated axillary peduncles. This was the *Tricuspidaria* (*Crinodendron*) *Hookeriana*, one of the *Eleocarpeæ*. Its petals, five in number, are saccate at the base, and toothed at the apex, and the form of the flower at once strikes one as peculiar, the petals converging from the base to the apex. Most of the flowers had dropped off, and were succeeded by the capsules, which were about the size of a large cherry, green in tint, somewhat downy, and containing from twelve to fourteen seeds in irregular loculi. On the beach we found some very large dead valves of the *Mytilus Chilensis* ("Choros" of the Chilians, by whom they are much esteemed), one specimen of which measured upwards of seven inches in length, as well as accumulations of the outer shells of a huge barnacle, the *Balanus psittacus*, which is likewise regarded as a great delicacy. I believe it principally occurs on the southern part of the coast of Chili, from Chiloe to Concepcion, and it frequently attains dimensions of nearly six inches in length by upwards of two in breadth. The terga are remarkable for being prolonged above into two slender elongated processes, whence the specific name. We observed a considerable variety of

birds, most of which were very tame. They included hawks (chimangos and carranchas), kingfishers (*Ceryle stellata*), ducks, spur-winged lapwings, and brown herons. A colony of the last named perched on the branches of a tree overhanging the beach, were amusingly bold, several not taking flight till the stones which we threw at them struck the boughs on which they were standing. We paid a visit to the Chillote owner of a sawmill at the head of the cove. As vessels very seldom visit this spot, the inhabitants were much interested by the sight of Englishmen; and while we sat for a short time in the miller's house, the principal room of which was heated, as is usually the case in Chili, by means of a large wooden dish of charcoal placed in the middle of the floor, a number of neighbours by degrees gathered, the women sitting in silence, wrapped in their shawls, in a long row on one side of the room, like so many images. The miller, who handed round a large tumbler of "aguardiente" to his guests, informed us that when the ship appeared, they supposed that we were Spaniards, and were under some apprehensions for their safety. It was curious to see in this out-of-the-way place a sheet of the *Illustrated London News* pasted up on one of the walls. How it got there we did not find out.

The morning of the 13th was fine, with the wind favourable, and we left Oscuro Cove, continuing our southerly course. The atmosphere was very clear for a time, and a fine range of snowy peaks on the mainland, in consequence, well seen, but rain set in in the course of the afternoon, and after a time a thick fog settled down, so that we did not go to sea, as originally intended, but anchored in Port San Pedro, at the southern extremity of Chiloe, at about five P.M. Next morning we passed out into the open sea, and soon encountered a

very heavy swell, causing the vessel to roll and pitch very unpleasantly. The 15th passed little less uncomfortably, the wind blowing hard during the night, and on the morning of the 16th we were glad to sight Cape Tres Montes. Shortly before noon we reached Port Otway, a fine harbour in the peninsula of Tres Montes, and there anchored for the remainder of the day. As usual, a party of us landed, and passed the afternoon on shore, some in quest of sport, and others on the look-out for specimens. I found the vegetation intermediate in character between that of the north of Chiloe and that of the northern Channels. Evergreen beech and Winter's-bark were among the prevailing trees in the thick woods, which were as wet as those of the western part of the Strait and the Channels. The stems of the trees were everywhere covered with a profusion of lichens, mosses, and ferns—species of *Hymenophyllum*, such as *H. cruentum, caudiculatum, pectinatum*, etc. etc., and *Grammitis australis*, being especially abundant. *Philesia buxifolia, Mitraria coccinea*, and several other shrubs not yet identified, were plentiful among the undergrowth ; and our explorations were rewarded by finding specimens of a beautiful Gesneraceous creeper, the *Columnea ovata*, which does not appear to have been previously recorded to the south of Chiloe. It ascended the trunks of the trees to a height of twelve feet or more, and its beautiful deep red flowers, which occurred near the tips of the branches, were somewhat difficult to procure. On one of the shrubs I captured a rather large beetle of the family *Lucanidæ*, the *Chiasognathus Reichei*, new to the national collection ; and the sportsmen shot a couple of otters, *Lutra Chilensis* (an animal which ranges from the Chonos Archipelago as far south as the Strait of Magellan), some kelp-geese, several kingfishers, and a white egret (*Ardea*

SPECIES OF HYMENOPHYLLUM FROM WESTERN PATAGONIA

egretta). The last bird, which we now saw for the first time, appears to be not uncommon in Chiloe, and probably also inhabits the Chonos Archipelago. The specimen shot on this occasion, which I preserved, had numbers of a small Dipterous insect crawling over the feathers. A variety of marine animals also were taken in the dredge. Several species of fish were present, among others the *Agriopus hispidus*, taken many years before by Mr. Darwin in the same locality, *Agonus Chiloensis*, the fry of a *Trypterygium*, some *Nototheniæ*, and a young specimen of a pipe-fish, the *Syngnathus acicularis*, not uncommon on the coast of Chili. Among the Mollusca were the *Nassa Gayi*, *Chlorostoma atrum*, species of *Fissurella*, etc.; and the Echinoderms comprised two species of *Echinidæ*, one of them being the handsome *Echinocidaris* dredged at Sholl Bay, and the other an undescribed form, of which, I am informed by Mr. A. Agassiz, another specimen exists in the museum at Stockholm. But few Crustacea were obtained, and these principally species common to the Strait and Channels (*Eurypodii*, *Porcellanæ*, etc.)

On the morning of the 17th we left Port Otway, and crossed the Gulf of Peñas, entering the Messier Channel in the course of the afternoon, and anchoring about five P.M. in a small cove off Fatal Bay in Wellington Island. Later in the evening, when the ship swung with the tide, her stern almost brushed the trees on one of the steep banks, and ropes were accordingly laid out to the banks on either side, and fastened to the trees, to prevent her suffering injury. Next morning we moved slowly southwards, looking for harbours, and finally anchoring in Island Harbour, on the coast of the mainland, shortly after four P.M., immediately after which Dr. Campbell and I landed to explore the neighbourhood. As is generally the case in the harbours in the Channels, we found that there

was almost no beach, the steep banks, densely covered with shrubs and trees, rising nearly perpendicularly out of the water. In many spots *Metrosideros stipularis* formed a regular fringe, with its lower branches dipping into the water. We found specimens of several plants observed at Port Otway, including a couple of creepers, one of them Bignoniaceous, judging from its foliage, but met with little that was absolutely new to us, one or two lichens excepted. *Lomaria boryana* here attained a great size, the stems of some plants being as much as eight to nine inches in diameter, by fully two feet in height. As usual, there was a great destitution of animal life, but one interesting discovery, due to Dr. Campbell (whom I found on all occasions an invaluable coadjutor in my researches on shore), was made, viz. that of a fine specimen of a species of *Helix*, fully an inch in diameter, of a depressed form, with a wide umbilicus. The animal was of a purplish-black colour. Although we anxiously sought for other individuals, we were completely unsuccessful, and we never met with a second example in any locality later visited by us. Unfortunately, I have not been able to lay my hands on the solitary example, which was sent to the British Museum along with nearly all the invertebrate animals collected, so that I cannot state with certainty to what species it belonged. In general appearance it bore a considerable resemblance to the *Helix Audouinii* of D'Orbigny.

The following day being Sunday, we remained at anchor. The day was fine and bright, with only occasional rain, and the harbour appeared to great advantage. At the head a fine cataract comes rushing down, and at the foot of this three porpoises were engaged for some time in disporting themselves in the perturbed water. The low trees of Winter's-bark, "Cipres," *Maytenus*, evergreen beech, and *Metrosideros*,

which clothed the banks, contributed a fine variety of tints to the land in our immediate neighbourhood; while, by gazing out of the entrance of the harbour, a fine view was gained of some distant mountain-tops freshly whitened with snow that had fallen during the night.

The morning of the 20th was clear and frosty, and leaving Island Harbour we proceeded southwards through the Messier Channel, anchoring in Halt Bay between five and six P.M. The weather next day was glorious; calm, bright, clear, and frosty; and the snow, which was gradually accumulating with the advancing season on the mountains, appeared exquisite in its dazzling purity; in some places sprinkled over the jagged black peaks, and in others forming great wreaths, exhibiting the most smooth and delicate curves, contrasting finely with the lower forest-clad slopes. As the vessel remained at anchor to allow the surveyors to carry on their work, a party of the non-surveying officers, myself among the number, borrowed the dingy, and spent the day most agreeably in pulling about a large bay communicating with our anchorage, and landing at different points. Everywhere the ground was soaking wet, with a covering several feet deep of moss and decaying plants, and, as usual, we had to scramble along, over and under rotting trunks, a rather fatiguing style of progression. At one place, in ascending a low hill, the summit of which commanded a good view of the bay (which was discovered to have a fine port, since named, in honour of one of the officers, Gray Harbour, opening into it), we observed the recent tracks of a deer; and at another spot, a specimen of a very curious bird, the "Guid-guid" or "Barking bird," (*Pteroptochos Tarnii*), was shot while sitting on a bough giving vent to its extraordinary cries. It is common in Chiloe and in the Chonos Archipelago, but we did not expect to meet

with it so far south, though, as I have since ascertained, it was observed both in the Gulf of Peñas and at Halt Bay in the course of a former survey. With its little wings, long body-feathers, short tail, and great legs and feet, it presents a most grotesque appearance. Mr. Darwin has justly remarked, that the name of "barking-bird is well bestowed upon it," observing that he defies "any one at first to feel certain that a small dog is not yelping somewhere in the forest. Just as with the cheucau, a person will sometimes hear the bark close by, but in vain may endeavour by watching, and with still less chance by beating the bushes, to see the bird." This we found to be the case alike with the barking-bird and the cheucau (*Pteroptochos rubecula*) at Chiloe, often hearing their strange cries in the course of our rambles, but very seldom getting a sight of them. A specimen of a little owl (*Glaucidium nanum*), obtained in the course of the previous season at Sandy Point, was observed in the woods, but not obtained. In cruising about the bay we saw numerous individuals of a little grebe, the *Podiceps Rollandi*, common in the Strait and Channels, but very difficult to shoot, on account of the rapidity with which it dives, and the impossibility of predicting in what direction it will come up. One was at length shot, and I was struck by the exquisite ruby red colour of the eye. They possess an exceedingly unpleasant fishy odour, which becomes very perceptible in the process of skinning them. I met with hardly any new plants on this occasion, but was interested to find that the *Hymenophyllum cruentum* extended so far south. I also found many malformed flowers of *Mitraria coccinea*, probably due to the attack of some insect on the flower-bud.

The morning of the 22d was fine, but not very clear, the atmosphere having a snowy appearance. In the forenoon,

while skinning the *Pteroptochos* obtained on the previous day, I found a number of small scarlet mites around and within the external aperture of the ear. The afternoon was directed to rambling about the neighbourhood of Halt Bay. I again observed a pinnate-leaved creeper seen at Port Otway and Island Harbour, forming cords, sometimes as much as twenty feet long, depending from the branches of the trees, and sought eagerly for flowering specimens, but in vain. Heavy rain set in between three and four P.M., and continued to fall in torrents until the afternoon of the 23d, when the clouds cleared off, and next day (24th) was splendidly clear and frosty. A party of us devoted the afternoon to cruising about from place to place in the dingy, two of our number ascending a hill, from the top of which we had a fine view of the Messier Channel, with its various islands and inlets. The only additional plants procured were a handsome lichen and the little *Pinguicula antarctica*, which had evidently long before passed out of flower. We saw several humming-birds ; and in the bay we shot a steamer-duck, and attempted to secure two others, which, however, foiled us, by steaming off at a tremendous rate (I should think not less than seven or eight knots an hour), making a noise like that of a paddle-wheel steamer in the distance, and leaving a wake of foam which extended for several hundred yards behind them. On our return to the ship, between five and six P.M., we learned that a party of Indians had been on board and had bartered some otter and deer skins for tobacco. Judging from the dimensions of a deer's foot, which was shown to me, the animal must have been of considerable size.

The 25th was another day of great beauty, the frost still lasting, and we left Halt Bay in the forenoon, and passing through the English Narrows, anchored in Eden Harbour.

Thereafter Dr. Campbell and I landed, and spent nearly a couple of hours on shore, walking over some boggy ground, where a *Sphagnum* of a deep purplish-red tint abounded. Rain fell in torrents during the next two days, but on the 28th it was again fair, though cloudy; and a party of the non-surveyors left the ship immediately after breakfast, and spent the day pulling about among the islands outside the harbour. On one of these I found a single specimen of an Iridaceous plant, which I afterwards ascertained to be a species of *Libertia*, in seed; and it is a fact worth recording that I never saw a second specimen of it south of the Chonos Archipelago. On the beach of the same island I obtained an example of a fish, the *Lycodes latitans*, previously procured in various localities in the Strait and Channels; and a specimen of the grayish-brown night-heron (*Nycticorax obscurus*) seen in the northern part of the Strait and the Falkland Islands, was shot. We also saw many kelp-geese, and several kingfishers, as well as two large flocks of steamer-ducks, which were making a great tumult in the water, raising a wave of surf fully a foot and a half in height, and causing a loud rushing sound by the rapid movements of their little wings. Cormorants were also plentiful, some with black and white, and others (young birds as we subsequently ascertained) with entirely black plumage. One of the latter, which was shot, had the skin of the feet raised into white diseased patches. We had two very exciting chases after otters, which at length escaped by taking to the land, and concealing themselves among the rocks and bushes. They swam with great rapidity, with only their brown heads out of the water, and often dived, coming up again at a long distance ahead of us. In initiating the dive, they bent their bodies in a marked curve, the middle of the back emerging above the surface of the water for an instant.

Drizzling rain fell during the forenoon of the 29th, but the afternoon was fair, though cloudy, and four of us pulled up to the head of a cove, where the otters had been seen on the previous day. Here I found some specimens of a rather large Chiton, the *C. granosus*, which is not uncommon in the Messier Channel, as well as at Chiloe. Later in the day we went outside the harbour to the islands, to look for a party of Indians who had come alongside the vessel in their canoe in the forenoon. On firing at some kelp-geese on a small islet, the Indians revealed themselves for a moment close to the beach of a neighbouring larger island, which we just then came in sight of, and, apparently frightened by the reports of the guns, ran up the steep wooded bank, accompanied by their dogs, and concealed themselves among the bushes, leaving their canoe deserted. We then pulled up to the shore, opposite one of the beehive-shaped wigwams which are so common throughout the Channels, being used as temporary habitations by the Indians in their wanderings from place to place, and which, in this instance, was covered with sheets of bark, and then lay on our oars, waiting till they should have recovered from their alarm. Presently, an elderly man appeared, attired in the usual cloak of otter-skins, and walked down to the boat, chattering something, which of course was utterly unintelligible to us. One of the party then gave him some tobacco, and made signs that he wanted skins, which the man appeared to understand, as he went off into the woods, and gave vent to some wild shouts for the purpose of summoning the rest of the party. In a short time, a woman leading a child, and accompanied by three dogs, emerged from the trees, and soon after, a young man with a sinister scowling expression, and with his countenance decorated with two stripes of white paint, came out of

the wigwam, and on being offered a knife and some tobacco, divested himself of his only garment, which he handed to the officer who was bartering with him, and marched off complacently with his newly acquired treasures. Heavy rain now set in, and continued all that night, and throughout the next day, with brief intervals.

The morning of the 1st of May was, however, fine, and a party of us accordingly left the ship early in the morning, and spent the day in a cruise along the upper part of Indian Reach, to the south of the harbour. We first entered the small cove (Lackawanna of the government chart), and went as far as we could get up a small river which enters the head of it, afterwards proceeding for some distance down the coast, landing here and there in search of specimens, but without obtaining any results of special value. Numbers of steamer-ducks were seen, in general too wary to permit of our getting near them, as well as numerous gulls (*Larus dominicanus*) and cormorants, several kelp-geese, and a black oyster-catcher. Several Cetacea of considerable size were observed blowing, and we had a long chase after an otter, which, however, succeeded at length in escaping us. The 2d was a day of heavy rain, and on the 3d the weather was only a little improved, there being but a few short intervals when the rain ceased, and the mist cleared partially off the mountains. Two kingfishers flew about the ship for some time, uttering their harsh, peculiar cry, and one lighted on the mizzenmast, sitting there for a short time. There was but little rain on the forenoon of the 4th, but in the afternoon it set in again in torrents. One of the members of a wooding-party, who spent the day on shore, brought me two species of Coleoptera, which he had found among the timber—one a Rhyncophorous species, the *Eublepharus nodipennis*, and

the other, a very handsome Longicorn, the *Cheloderus childreni*, previously recorded from Valdivia. It rained tremendously throughout the rest of the evening, and all night long, only ceasing for a short time on the morning of the 5th, after which it began again with redoubled vehemence, and continued during the 5th, 6th, 7th, and throughout the earlier part of the 8th, enabling us to corroborate the sagacious remark of a former surveyor as entered on the published plan of Eden Harbour, that here was "good fresh water in abundance,"—a statement which, however, equally applies to the whole extent of the Channels and that portion of the Strait of Magellan between Port Famine and the western entrance. The weather was, however, far from affording material for mirth, having a most depressing influence upon us, in consequence of the enforced idleness which it necessitated, the land being so shrouded in mist as completely to put a stop to surveying operations; and our situation was far from enviable, as we lay at anchor, shut in on every side by steep mountains, on which there was not a dry spot whereon to place our feet, and which was for the most part covered by thick evergreen forests, into which it was only possible to penetrate for a very little distance. As we were not provided with proper rain-awnings, moreover, the ship was in an unpleasantly moist condition, her deck having never thoroughly dried since we left Sandy Point, two months previously; and when our clothes got wet through, as they not uncommonly did, it was with the greatest difficulty, owing to our limited space, that we could get them dried again.

After descending in perfect streams during the forenoon of the 8th, the rain ceased for about a couple of hours in the afternoon; and we then left our anchorage at Eden Harbour, and moved northwards to a new berth near

the upper end of the English Narrows, named Hoskyn Cove, in honour of one of the surveying officers. There had been a heavy fall of snow during the previous night on the higher ground, and many of the mountains in the vicinity of the Narrows were whitened half-way down, and the innumerable cascades which rush foaming down their sides greatly swollen. It was raining again when we reached our destination about five P.M., and heavy rain fell throughout the night and during the forenoon of the 9th. On the afternoon of the same day, as it had somewhat abated, and we were anxious to examine this new locality, a party of four of us, encased in waterproofs and sea-boots, took the dingy and left the ship for some hours. The land rose in very steep, precipitous, wooded mountains on all sides, so that it was with some difficulty that we could get on shore, and that fairly accomplished, we found it impossible to scramble far. I, however, succeeded in finding two plants that were new to me, and which I never subsequently found in any other locality. One of these was a fern, a species of *Blechnum*, apparently distinct from that obtained at Chiloe; and another, a herbaceous plant, probably Gesneraceous, with ovate-elliptical leaves and handsome scarlet flowers, which was growing in the clefts of the rocks. Unfortunately, it was almost out of bloom, so that I only obtained a single flowering specimen. A tall branching fern previously observed at Chiloe, the *Alsophila pruinata*, was here growing in wonderful luxuriance, some of the fronds attaining a height of upwards of twelve feet, and the steel-gray colouring of the back communicating a very handsome appearance to them. *Callixene polyphylla*, not previously recorded to the south of the Chonos Archipelago, ascended the trunks of the trees to a height of from seven to nine feet, and the pinnate-leaved creeper already mentioned as

seen at Halt Bay and Island Harbour, together with another climbing plant, also with pinnate leaves, was abundant, as were also *Mitraria coccinea* and *Hymenophyllum cruentum*. This I may remark was the southernmost locality where I met with this elegant little fern. A turkey-buzzard (*Cathartes aura*) was shot as it was flying over the water, and afterwards skinned by me. It formed a truly disgusting object when we picked it up, with its naked scarlet head which resembled an unhealthy ulcer, its ruffless neck, dull brown plumage, and ugly legs. The feet were partially webbed, the nostrils very large, and the tongue deeply hollowed out, as if for the purpose of scooping up filth. These birds, though extremely plentiful in Chiloe, become rather scarce to the southward. In the Channels and western part of the Strait we saw them occasionally, but never more then a couple of individuals at any one time.

Rain continued throughout the afternoon of this day; in the evening set in with increased vehemence; and during the whole of the 10th fell in torrents. By this time Captain Mayne judged it advisable to leave the Channels for the season, as the weather was so extremely bad that very little work could be accomplished. On the 11th, accordingly, when the weather was somewhat improved, we left Hoskyn Cove, and moved slowly northwards along the Messier Channel. In the forenoon we met a Chilian vessel on her way to Sandy Point, with emigrants and provisions for the colony, and we availed ourselves of the opportunity thus presented to despatch letters by her. While lying-to we observed several Cape pigeons, birds we had never before noticed in the Channels, and a sure evidence of bad weather outside. After proceeding northwards for between twenty and thirty miles, we anchored about four P.M. in a small new harbour in the

mainland, named Connor Cove, in honour of one of the surveyors, immediately after which three of the officers with myself took the dingy and went off to explore a small river which debouched at the head. This we found to be tolerably wide and deep for some distance, succeeding in pulling up the stream for nearly a quarter of a mile before we grounded. Had it been earlier in the day, and the sun shining brightly, it would have furnished a beautiful scene for a picture, the water flowing slowly between steep wooded banks, behind which high mountains arose. The only living objects to be seen were a steamer-duck and a large fish swimming rapidly about.

The 12th was nearly free from rain, and we left our anchorage early, reaching Island Harbour shortly before noon. As it was determined that we should remain here for the rest of the day, I resolved in occupying the afternoon in the ascent of a very steep hill, about 2000 feet in height, on the left side of the head of the harbour, and accordingly set forth at one P.M., accompanied by one of the officers who was also ambitious of the exploit. On landing we found the ground even less adapted for walking over than we had calculated, the land being disposed in steep ridges, with thickly wooded, deep, and narrow intervening valleys, which required a severe amount of scrambling to cross. The ground was everywhere wringing wet, and in many places we sank far above the knees in pools of water, and were compelled to circumambulate various streams and small lakes, which caused our route to assume a very meandering character. After we had accomplished a little more than a third of the way, my companion, who was not in such good walking trim as myself, gave in, and, after having vainly attempted to dissuade me from going farther, sat down on a rock to

await my return, while I pursued my solitary way over the steep and rugged ground, alternately ascending and descending. At length I reached the top of a ridge separated from the terminal sugar-loaf-shaped peak of the mountain by a deep thickly-wooded gully, which descended steeply on one side towards the Channel, and on the other was, as it were, bridged over by a narrow neck of rock continuous with the peninsula over which I had hitherto been walking. Here I at first thought that it would be impossible to proceed farther, as the conical peak in front of me rose almost perpendicularly, but, after due deliberation, resolved to make the attempt. So, having disburdened myself of my botanical case and geological hammer, I proceeded to scale the peak by means of digging my feet into the thick coating of moss which coated the rock-faces, and dragging myself up by the tufts of wiry grass and stunted shrubs which projected horizontally outwards. At last, after strenuous exertions, I gained the summit, and was rewarded by a glorious view of the Messier Channel, with its inlets, islands, and high mountains on either side, together with the harbour, and two deep tarns, which fed the cataract which poured down at its head. I was, however, disappointed in what had been my principal object in undertaking the ascent—namely, the hope of meeting with species of plants which did not occur at a lower level. This result, I may remark, completely accorded with my subsequent experiences in these regions, as, though I ascended many mountains in the course of the following season, I found exceedingly few plants at an elevation of from 1000 to 2000 feet, which did not also occur equally plentifully at the level of the sea. This, I suppose, may be reasonably explained by the fact that the climate at the level of the sea in these regions is alpine or

semi-alpine in its character, the snow-line descending in many parts as low as 3000 feet or less. As a rule, the summits of these mountains, which are not so high as this, are composed of bare rock, either worn smooth by the constant flow of water over them, or sharp and jagged like the teeth of a saw. Nearly the only plants noticed on this occasion were a few stunted bushes of *Libocedrus*, *Berberis ilicifolia*, and the evergreen and antarctic beeches, together with a *Lycopodium*, which occurs abundantly in the Strait and Channels, trailing over the damp ground.

After resting for a short time on the summit, I began the descent, soon finding that the only practicable method of procedure was to sit down and slide, checking my velocity as I best could by catching at the occasional stunted shrubs. I had safely accomplished the greater portion of the way in this manner at an express rate of speed, when I suddenly found myself arrived at the top of a precipice whose height I could not estimate. I therefore grasped a rotten stump at one side, to enable me, if possible, to avoid my apparent fate, but it treacherously snapped in my hand, and the next sensation of which I was conscious was that of lying extended on a bed of soft moss, with a somewhat bewildered idea as to where I was, and blood flowing from my nose and mouth. In a few minutes I collected my senses and got up, feeling considerably bruised, and then found that I had fallen over a cliff about fourteen feet in height. After this the descent was much more gradual, and, having recovered my implements, I joined my companion in course of time, and we retraced our steps together during the rest of the way. In one of the wooded valleys near the foot of the hill I was much delighted by at last finding the pinnate-leaved, and, as I rightly judged, Bignoniaceous creeper,

observed at Port Otway, Hoskyn Cove, Halt Bay, and Eden Harbour, in flower. We first noticed some fallen blossoms on the ground, and soon after, looking up through the branches of a *Podocarpus*, observed the plant, with two clusters of flowers, and numerous old capsules from which the seeds had escaped. My companion benevolently climbed the tree for these, and, on going a few steps farther, we came upon the white skeleton of a dead tree, round which a specimen had twined itself—clusters of the beautiful rose-coloured flowers hanging down from the branches. This fine plant I subsequently ascertained to be the *Campsidium Chilense*, previously recorded from Valdivia, Chiloe, and the island of Huafo, between Chiloe and the Guaytecas Islands; and its occurrence more than five degrees farther south* than the last-named locality is, I think, of considerable interest. Its flowers, when in the fresh state, are never orange (as stated by Dr. Seemann †), according to my observations, but invariably of a fine rose-colour. Six months later I observed the plant at Port Laguna, to the north of the Darwin Channel, in the Chonos Archipelago. It is apparently an evergreen, and the leaves are impari-pinnate, there being from four to six pairs of lateral pinnæ.

This day I also found, growing on an evergreen beech, a fungus that was new to me, and which bore a very close resemblance to, if indeed it were not identical with, the *Bulgaria inquinans* of Great Britain.

On the 13th we left Island Harbour, and passed slowly northwards through the Messier Channel, looking for harbours on the way, and emerging into the Gulf of Peñas in

* Eden Harbour, lat. 49° 10′ S.

† *Ann. and Mag. of Nat. Hist.* Ser. iii. No. 55.

the afternoon. The wind was S.W., and the barometer rising, so that it was considered advisable to push out at once ; but on clearing the land we encountered a tremendous swell, which caused the vessel to roll and pitch in such a manner as, with all our previous knowledge of her capacity in that line, we could hardly have thought possible, and which caused many even of the oldest seamen in the ship to suffer from sea-sickness. The night passed uncomfortably ; but we went along more steadily throughout the greater part of the next day, numbers of Cape pigeons, Fulmar, and brown-headed petrels, accompanying us. On the 15th we steamed full speed throughout the day against a strong head wind—the jolting, shaking, rolling, and pitching thus caused being almost insufferable, while, to add to our discomfort, heavy rain set in some time after. The weather soon became so thick that it was impossible to ascertain our exact position, and between six and seven P.M. the engines broke down, so that we were obliged to lie-to for about four hours in a most unenviable position—the night pitch dark, rain descending in torrents, a gale blowing in our teeth, the Guaytecas Islands under our lee, the island of Huafo outside, the rocky coast of Chiloe to windward, and no land seen since one P.M. Providentially, before long the wind shifted, and then died down, and in the course of time there was nearly a complete calm. Land was at length sighted early on the forenoon of the 16th, and about two P.M. we reached Port San Pedro, where we remained for the rest of the day, rain descending as if it never intended to cease. It may aid in conveying to the reader an idea of the damp condition of things on board in this weather, when I mention that dried plants brushed free from mould one day were equally thickly covered with it the next, and that I had the utmost difficulty

in getting my drying-paper sufficiently free from moisture to be fit for use.

The morning of the 17th was fair and bright; a great relief. We got under way, and proceeded along the east coast of Chiloe as far as Tenoun Point, anchoring there between four and five P.M. Rain came on in the evening, and next morning the aspect of the weather was so doubtful that we remained at anchor, as our stock of coal was so much reduced that we could not afford to steam against the wind, should it arise. A few of us took advantage of this circumstance to spend a short time on shore, landing soon after breakfast. There is a small village of Tenoun, with a church like a Chinese pagoda, officiated in by a couple of padres, whom we met. They were both young and rather pleasant-looking, attired in low straw hats and a long gray woollen garb, provided with a cowl, and reaching to the ankles. Here, as at other places in Chili, *Myrtaceæ* prevailed largely, and a species of *Loasa* was plentiful among the herbaceous plants, but out of bloom at this time. *Rubus geoides* was also very common, and in pools of fresh water I found a *Riccia* and a *Lemna*. In the afternoon, the weather appearing more settled, we weighed and proceeded northwards, the unpleasant discovery being shortly after made that we had not enough coal with which to reach Ancud. We therefore proceeded as far as Huite, close to Oscuro Cove, and there anchored in a curious little harbour, bounded on one side by a long very narrow curved sand-spit, to lay in wood for steaming purposes. Heavy rain, as usual, came on in the evening, and the 19th was a day of thick mist and drizzling rain, with occasional brief fair intervals. Early in the morning one of the officers was despatched in the steam-cutter with our letter-bag to Ancud, to endeavour to catch the mail, and soon after a wood-

ing-party was sent on shore for timber. A party of four of us landed in the rain after breakfast, and had a walk, finding everything in a universal state of sponge. We saw a white egret, similar to that obtained at Port Otway, some steamer-ducks, oyster-catchers, and cormorants, and picked up some very large valves of *Mytilus Chilensis*, and great fragments of *Balanus psittacus*. I obtained but little that was new to me in the botanical line, with the exception of a few ferns and a curious fungus, several examples of which I found growing in the sand of the beach, above high-water mark. This was a species of *Clathrus* or *Ileodictyon*, and consisted of a cup-like volva partially buried in the sand, and formed of a rather tough membrane, enclosing a mass of gelatinous substance, possessed of an extremely fetid odour, resembling that of the common *Phallus fœtidus;* and of a branched reticulated cage-like receptacle of a snow-white colour, with its lower extremity imbedded in the fetid jelly. Some of the specimens of this receptacle were as much as six or seven inches high, by between three and four in diameter.

Rain fell in torrents throughout the whole of the next day. The wooding-party were again on shore, and early in the day brought on board a curious little quadruped, taken in the fork of a large tree which they had felled. I was much interested to recognise it as a Marsupial, and on subsequent examination ascertained it to be the *Didelphys elegans*, not uncommon in the neighbourhood of Valparaiso and Concepcion, but which, I believe, had not previously been observed farther south than the River Lieubu, in lat 37° 33′ S., the present locality being to the south of lat. 42°. The body measures between four and five inches in length, and is clothed with grayish fur above, while beneath it is nearly white. The eyes are very large and protruding. The feet

are well fitted for climbing, and the tail is remarkably stout, and thick at the base. I found the body loaded with fat, and the skin extremely greasy. Later in the day the officer in charge of the wooding-party brought me off a small frog of the genus *Cacotus*.

The 21st was a tolerably fine day, and we left our anchorage after breakfast, with the intention of reaching Ancud. Unfortunately, however, the wood used for steaming proved to be so thoroughly wet as to be of but very little value as fuel, and our rate of progression, at first sufficiently moderate, became by degrees slower and slower, till at length we feared that the revolutions of the screw would cease altogether. Crawling along at a snail's pace, we reached, after some hours, the entrance of the Chacao Narrows, when the tide helped us. While passing slowly through the Narrows, we descried the steam-cutter close to one of the shores, and she shortly after joined us, with a supply of letters from England, bearing date of only two months back. We anchored in the Narrows that evening when the tide turned against us, and next day, which we were surprised to find bright and sunny, we remained stationary until noon, when the tide turned in our favour, and then went slowly on to the bay of Ancud, reaching our old position at Punta Arenas between three and four P.M. Soon after that I landed, and had a walk with two companions. On the sandy beach numbers of an Amphipod (*Orchestoidea tuberculata*), much resembling our common sand-hopper in general appearance, were skipping out, and in a small rock-pool, not much more than two feet in diameter, I observed hundreds of a small pale-coloured *Actinia*, each individual of which had its base fixed in a hollow in the rock, and withdrew from view on being touched. Many of the plants had gone out of flower, owing to its being the beginning of winter, only a few

lingering blossoms remaining on the fuchsias and *Escallonias*, but the scarlet *Loranthus* was still in full bloom, and brightened up the dense thickets.

The morning of the 23d was fair, and the horizon beyond the bay remarkably clear; the distant Cordillera rising hard and sharp against the sky, its peaks showing black like the teeth of a saw. Two of the officers and I landed early, with the intention of spending the day on shore, and walked for some miles along the beach in the direction of the head of the harbour. In the water we saw several specimens of a large grebe, apparently the same with one observed at the river Gallegos and at the eastern entrance of the Strait; and on the rocks a pretty little gray bird, with a white line on each side of the head, the *Cinclodes Patagonicus*, very common in the Strait and Channels, was hopping about, approaching very close to us at times. This little creature has the curious habit of lighting on the floating masses of kelp not far from the shore, and searching the fronds for its food, which consists principally of marine animals. On the west coast of South America it extends, at least, as far north as Valparaiso. A second species of the genus obtained in the Strait, where however it does not appear to be nearly so common as the former, was the *Cinclodes fuscus*. Heavy rain came on about noon, and as it showed no symptoms of abating, we retraced our steps to the landing-place, and got on board about three P.M. It rained and blew hard during the night; and though it was calm on the morning of the 24th, the deluge continued as great as ever, and the wind again got up later in the day, and all that night it blew and rained. The rain continued unabated during the whole of the 25th and 26th, coming down with a roaring sound, and such vehemence that five minutes' experience of it would have been sufficient to drench one to the skin.

It was fair, however, on the morning of the 27th, and Captain Mayne, Dr. Campbell, and I, went over to Ancud, where some of the officers were being photographed in surveying costume, for the edification of their friends at home. After a walk into the country beyond the town, we re-embarked early in the afternoon, and returned to the ship. Later in the day a few of us spent some time on shore, and one of the officers succeeded in shooting a male and female scissor-bill (*Rhynchops melanura.*) On the morning of the 28th we weighed, and left the bay of San Carlos on our northerly voyage, but soon encountered the wind right in our teeth, with a very heavy swell, and therefore altered course and returned to our anchorage, reaching it some time after noon. It rained very heavily throughout the remainder of the day, and throughout nearly the whole of the 29th—a N.W. gale blowing at the same time, accompanied with a display of very vivid lightning and loud peals of thunder. The 30th was fair, though still blowing pretty hard. In the forenoon a large flock of very beautiful cormorants (*Phalacrocorax Gaimardi*), with bluish-gray and white plumage, yellow bills, and scarlet legs, lighted on the water not far from the ship, but we were unable to procure any. One of the officers recognised them as specimens of a species of which he had seen two examples on one occasion on the Messier Channel, but there they must be very rare, as I never saw any to the south of Chiloe. In the afternoon Dr. Campbell and I landed, and obtained by means of his skill specimens of several small birds, including the lesser woodpecker of the Strait (*Picus ligniarius*), some thrushes, and two individuals of the "Rara" (*Phytotoma rara*), regarding whose affinities a considerable amount of difference of opinion has prevailed among ornithologists. Molina was, I believe, the first to describe this curious bird, which, in

general appearance, resembles a large finch or bunting, but is at once distinguishable by the remarkable peculiarity of the edges of its mandibles, which are regularly serrated, in his *Saggio sulla Storia Naturale del Chili;** remarking that it feeds on green herbs, and that, for mere pastime only, it is very destructive to various vegetables which it does not feed on, so that a continual war is carried on against it by the peasantry of the districts in which it occurs, in consequence of which it frequents solitary wooded places, where it builds its nest high up in the shrubs.

This day I also obtained fine flowering specimens of a tall Malvaceous shrub, the *Sida vitifolia*, with tomentose five-lobed leaves, and large handsome flowers varying from pale purple to white, and sometimes exceeding two inches in diameter.

On the 31st it was raining and blowing hard during the earlier part of the day, but the wind gradually fell, and the rain ceased after three P.M. On the 1st of June we again left the bay, making very little way during the day, as the wind was against us, and being under sail alone, we were consequently obliged to tack repeatedly. In the evening the wind shifted in our favour, and we accomplished a considerable distance during the night; but on the 2d it was again unpropitious, compelling us to tack perpetually. On the 3d the same state of things continued, save that we progressed rather more quietly. The 4th was a thick misty day, the wind still against us, causing us to alter course frequently; and an anxious look-out for land was maintained, as, from the sun not having been visible for the last few days, no observations had been obtained, and we had therefore a very vague conception as to our true position. Suddenly, about one P.M., there was a shout from the look-out of "Breakers

* P. 255.

ahead!" and the mist opening for a moment disclosed a long reef, over which a furious surf was breaking. Orders were immediately issued to put the ship about, an operation which fortunately was successfully accomplished, as, had she continued five minutes longer on her course, her fate, and probably that of most of her inmates, would have been sealed. Subsequent examination of the charts rendered it, I believe, evident that this spot, on which we were so nearly being wrecked, was in the vicinity of Tucapel Point, to the south of which H.M.S. "Challenger" was lost in 1835.

The 5th was thick and misty in the morning, but the weather cleared up in the course of the forenoon, and land was sighted, enabling us to determine where we were; and we therefore steamed straight for Lota in the great bay of Arauco, Captain Mayne having determined, before we left Ancud, to stop there in order to take in a supply of fuel, there being extensive deposits of tertiary coal in that district. In the course of the afternoon, as we were passing along near the coast, we observed several large patches of discoloured water; but, as I did not succeed in procuring any for examination, I could not ascertain the cause of the phenomenon. The land along which we passed was thickly wooded, though not nearly so much so as that at Chiloe, and some of the strata seen in section on the cliffs were very obliquely inclined. There was a rather heavy swell till we entered Arauco Bay, after which we had quiet water, and we reached the little bay of Lota about eight P.M., and soon after anchored. It was a lovely moonlight evening, and the settlement presented a very striking appearance, from the numerous lights of its copper-smelting furnaces, across which shadowy human forms were to be seen moving, and the columns of thick white smoke which were issuing from the mouths of the chimneys. We found several ships lying at

anchor, the greater number laden with cargoes of copper. The morning of the 6th was calm, and at first rather hazy, but before long brightened up into a warm sunny day, very agreeable to us after our wet experiences in the south. Two of the officers and I landed, soon after breakfast, at the end of a long jetty, used chiefly for embarking coal, and visited the town, which is divided into two parts, one of which (Upper Lota) is situated on the top of a low hill to the north of the anchorage, while the other (Lower Lota) lies in a small valley at the head of the bay. Much rain had fallen lately, and we found the centre of the streets of the lower part of the town knee-deep in clayey mud, through which oxen were dragging carts moving on solid wooden wheels, which emitted a succession of creaks and groans, testifying to the difficulty of progression. The town presents a rather squalid appearance, all the houses being constructed of wood, and the greater number of them only one storey in height, on account of the numerous earthquake shocks to which this neighbourhood, in common with that of Concepcion, about thirty miles to the northward, is liable. There are, however, one or two very good detached dwellings, principally tenanted by the officials employed by the Lota Company, and one, standing on the top of the hill on the north side of the anchorage, serves as a mess-house, where several gentlemen breakfast and dine together.

After spending a short time in strolling through the streets, we descended to the smooth sandy beach below the town, finding the tide high, and a rather heavy surf breaking. Here I found a few specimens of a crab resembling our British Corystes,—the *Pseudocorystes sicarius*, widely distributed on the coast of Chili,—as well as some large masses of curiously-shaped molluscan egg-cases. Looking out on the waters of

the bay we observed a remarkable object at some distance, which we by-and-by ascertained to be the horns and upper part of the head of a bullock, which was swimming to the shore from one of the ships lying at anchor. On approaching the land it had some slight difficulty in getting through the surf, in which it was entirely immersed for a moment or two, but soon stepped out on *terra firma*, where two poncho-clad horsemen, provided with lassoes, were waiting to receive it. It was, however, by no means disposed to be caught, and ran off through the streets close to the beach, exciting a most ludicrous amount of terror among the inhabitants, who rushed into their houses with wonderful rapidity. After waiting to see it lassoed, a process speedily accomplished, we proceeded southwards along the coast of the bay, scrambling over that portion of the rocks not covered by the tide, and climbing the steep shrubby banks above them. Not far from the shore we observed one or two remarkable large rocks used by cormorants as resting-places, one of which presented a striking resemblance to a couching lion. We had not gone far before I had the delight of seeing for the first time that exquisite twiner *Lapageria rosea*, the "Copigue" of the Chilians, with the appearance of which, as seen in hothouses, some of my readers are doubtless familiar. The plant winds over shrubs and low trees in a very elegant manner, and the flowers, shaped somewhat like those of a lily, are often as much as three inches long, of a thick waxy consistence, and of a most splendid deep rose-colour, minutely spotted with white in the interior, and marked at the base of each segment with a small blotch of dark purple. A white variety of the flower is also to be met with, but is of much rarer occurrence. The plant is a near ally of the beautiful *Philesia buxifolia* of the Strait, but is much handsomer, and possesses a greatly more limited

range, apparently only extending from the north of Valdivia to the north of Concepcion, a space of between three and four degrees, while *Philesia* ranges over nearly fifteen. One interesting fact with regard to the Copigue, is its extreme hardiness, being almost the only plant that can exist in the area covered by the sulphureous smoke of the smelting-furnaces. This was remarked to me by the manager of the Lota Company's works, to whom, as well as to the various officials of the company, we were indebted for much attention; and I verified the observation for myself subsequently, finding specimens in a flourishing condition winding around the skeletons of shrubs killed by the smoke. The Chilians sometimes make use of the flowers for poultices.

This being the winter season, most of the plants were out of bloom, but I met with several that interested me, including a yellow-flowered Composite, forming a tall shrub (*Euxenia*); another very tall fragrant shrub or low tree, belonging to the order *Monimiaceæ*, the "Boldu" of the Chilians (*Peumus Boldu*); and a species of dodder (*Cuscuta*), known by the name of "Cabellos de Anjel," or angel's hair, which twined over many of the shrubs, and was, I was informed, like the European kinds, very destructive to crops. Among the ferns, an *Adiantum*, similar to one common at Chiloe, and the widely-distributed *Polystichum aculeatum*, were specially plentiful, and many plants of *Asplenium obtusatum* also occurred among the clefts of the rocks above the beach. On the rocks, uncovered by the tide, we found myriads of a small Gasteropod, like a large *Rissoa*, as well as numbers of a species of *Littorina*, and many examples of *Monoceros glabratum*, *Amyxa niger*, and a variety of *Chitons*. On this and the succeeding day I was much struck with the exquisite beauty and wonderful diversity of the *Actiniæ* in the rock pools. Their principal

colours were white and various shades of pink, purple, and green, one or two being of a splendid emerald hue. A few Crustacea were met with in the pools, and among these I may mention an olive-green shrimp-like species (*Betœus scabrodigitus*), which was difficult to capture from the extreme agility of its movements, and a small crab (*Acanthocyclus Gayi*), which stoutly resisted attacks made on it, giving most savage nips with the great pincer claw of its right or left arm, which always greatly exceeded in size that of the corresponding side. At high-water mark we further observed several specimens of the horny egg-case of the *Callorhynchus*, and many large dead shells of *Concholepas*, *Fissurellæ*, etc., as well as one or two dead specimens of *Oliva Peruviana*, and two examples of a Corystoid crab (*Bellia picta*), which appears to be a rare species, as in the British Museum, in addition to those found by me, there are only a couple from the coast of Peru. With the exception of cormorants, we noticed but few birds of any description, almost the only ones observed being the *Curœus aterrimus*, so common in the Strait and Channels, and a flock of pigeons similar to those seen at Chiloe. On our return to the town we visited the copper-smelting works, and were conducted through them by the overseer, a north-country Englishman, who was most polite, explaining to us all the details of the process, and also presenting us with specimens of the copper in various stages. It was strange to look in at a hole in the side of one of the furnaces, and see the golden surface of the molten metal as clear as a mirror, and stranger still to watch the liquid stream flowing out into the moulds of sand constructed for its reception.

The morning of the 7th, Sunday, was very foggy, the sun sometimes breaking through the veil for a few minutes, and then again disappearing. We had hoped to have had the

opportunity of going to church on shore in the forenoon, as Lota is one of the stations of the South American Mission; but owing to the absence of the Rev. Mr. Gardiner, the resident clergyman, who was then in England, we were disappointed. Between one and two P.M., a party of us landed to take a walk, with the intention of gaining a view of the neighbouring bay and town of Coronel. In passing through some grounds surrounding the house of the proprietor of the Lota mines, it was pleasant to recognise a number of our familiar garden favourites at home, such as mignonette, wallflower, stock, candytuft, snapdragon, and others, which we had not seen for nearly two years. The town presented the usual Roman Catholic Sunday aspect—knots of people, many of them half intoxicated, lounging idly about the streets, while, issuing from the miserable wooden hovels, we heard songs, accompanied by the "tweedling" of guitars. As unfortunately the afternoon was very misty, we failed in our object, and after a time made our way down to the beach to the north of Lota, and walked along the rocks, which in certain spots were very remarkable, stretching out from the base of steep sandstone cliffs, so as to form broad, flat plateaux, exhibiting numerous deep fissures and hollows, produced by the action of the surf, which at this time was beating violently outside. A pretty purple starfish, apparently a species of *Asterina*, was abundant on the flat rock in moist places, and the pools abounded in Actinia, Mollusca, and Crustacea. At one spot a regular hedge, about a foot high, of a stout, branching, shrubby sea-weed, stretched along for many yards, rising and falling upon the top of the surf.

On the 8th, Captain Mayne and I landed in the morning for the purpose of taking a long ride into the country, but

rain unfortunately came on, and lasted so long as to prevent our carrying out the project. At the house of a gentleman who acts as consular agent, etc., I was shown a small collection of cryptogamic plants from Valdivia, and I found that by far the greater number were identical with species which I had collected in the Strait and Channels. Later in the day the engineer of one of the coal-mines (that nearest the town) having kindly offered to take any of us who felt disposed to visit the pit, two of the officers, with myself, availed ourselves of the chance presented, and, arrived at the mouth of the shaft, descended it in two relays, in a cage. The depth of the shaft is fifty-five fathoms, but I was informed that the mine in some parts sinks to a hundred. There are three workable seams of Lota coal, the lowermost five feet in thickness, the middle four, and the upper three; but of these, only the two lower were displayed in this mine. Above the lowermost seam occurs a very thin stratum (about an inch and a half in thickness) of very finely laminated sandstone, abounding in the leaves of dicotyledonous plants; and between this and the next seam of coal a band of compact grayish-green sandstone about ten feet thick intervenes. Provided with miners' lamps, we explored the mine for a considerable distance, under the guidance of the overseer, passing through a passage little more than three feet high for part of its extent, and seeing the coal worked, each of us going through the orthodox process of hewing out a sample with a pick for ourselves. The miners were naked to the waist, on account of the heat; and we were told that most of those employed were half-breed Araucanians. From what I could learn, these Chilian miners appear to be quite as improvident in their habits as colliers frequently are in England; for they are paid once a fortnight, and then no more

work is to be got out of them till the greater part of their money is squandered in drink. Like their northern brethren, they are also fond of good living.

On the 9th, at seven A.M., we left Lota for Concepcion Bay. The day was rather hazy, though fine, so that we could not take in the full extent of this fine bay, as we entered it, passing the island of Quiriquina at its mouth, early in the afternoon. We anchored at about half-past two off Talcahuano, the seaport of Concepcion; and soon after I landed with some of the officers, and we crossed over the narrow neck of land which separates the bay from Port San Vicente to the southward. Owing to the season of the year, and the sterility of the soil, there were very few plants in flower, a yellow *Œnothera* and the *Phacelia circinata*, previously obtained in the Strait of Magellan, being nearly the only species met with, with the exception of a leafless spiny Rhamnaceous under-shrub, a species of *Colletia*, which was very abundant. We noticed several specimens of the burrowing owl common in the Strait, and captured a snake (*Tachymenis Chilensis*) and several specimens of a curious little spotted frog, the *Pleurodema Bibronii*, provided with a prominent gland on each side of the loins. The sandy beach of San Vicente Bay was strewed with hundreds of fragments of a crustacean of the genus *Hippa*, the *H. talpoides*, but very few perfect examples were present. On our return to Talcahuano, we occupied a few minutes in the inspection of the town, which presents a very squalid appearance. By this time the mist had cleared off, allowing us to gain a fine view of the bay, and a lovely serene sunset was succeeded by a fine starlight evening. Arrangements were made that night for a ride over to Concepcion, about nine miles distant, next day, the British Consul, Mr. Cunningham, having kindly placed

at Captain Mayne's disposal three horses, one of which was allotted to me.

The morning of the 10th was beautifully bright and clear, and the air delicious, in fact everything that could be wished to make a ride thoroughly charming, and shortly after nine A.M. I landed with Captain Mayne and one of the officers, and we proceeded to the consul's office. While waiting for the horses, we had a considerable amount of talk with Mr. Cunningham, who possesses a most extensive knowledge of Chilian affairs, and I then inquired of him if anything was accurately known as to the numbers of the Araucanian Indians, receiving for reply that it was impossible to ascertain precisely, but that they probably numbered about 50,000, although they were rapidly disappearing—a fact that one could not hear without regret, as there can be no doubt that these people constitute one of the finest aboriginal races in the world, and they have maintained their independence, ever since the Spanish conquest, in an almost marvellous degree. Shortly before ten A.M. we mounted our steeds and rode out of the town, passing the entrance of a hotel where five of the officers were selecting horses wherewith to follow us. The ride proved most delightful, the country, though rather flat and sterile in many places, looking very attractive in the clear sunlight. As we rode along I observed numerous winding rifts in the ground, probably due to the frequent occurrence of earthquakes. On passing various hovels from time to time, we were assailed by packs of curs, who rushed after us, barking furiously and snapping at our horses' heels. Here and there some pretty *Acacias*, not natives of the country, were in flower, and the rounded bushes of the Boldu prevailed in the uncultivated tracts. We did not gain any prospect of Concepcion till we were close upon it, owing to its straggling over a flat de-

pressed tract of country, and the greater number of the houses, on account of the earthquake shocks, being built only one storey high. On riding into the town, we dismounted at a hotel, where we were joined by the others. Here we remained for about a couple of hours, and had luncheon, where we tasted for the first time a very good red wine of the country, which goes under the name of "Mosto." After this we got into our saddles, and proceeded, under the escort of a soldier, sent for that purpose by the Intendente, to whom Captain Mayne brought an introduction, to view the environs of the city. Our guide first conducted us to the summit of a low hill, whence we had a good bird's-eye view of Concepcion, and then led to a spot on the banks of the Bio-Bio river where there is a ferry, which a coach which runs between Concepcion and Coronel daily crosses. Our sight-seeing over, we rode rapidly back to Talcahuano, and soon after went on board, immediately after which we got under way for Valparaiso. The evening was calm, but a thick fog settled down, and we steamed along all night at a rate of from six to seven knots, the steam-whistle being blown at intervals to give timely warning to any other vessels that might be in the way. The 11th was perfectly calm, but very foggy for some time. We steamed along through a sea like oil, noticing thousands of large Acalephæ floating in the water, and many specimens of a pretty gray petrel resting on its surface; and very early on the morning of the 12th we anchored in the bay of Valparaiso.

CHAPTER XII.

VALPARAISO — WALKS IN THE NEIGHBOURHOOD — EXCURSION TO SANTA ROSA—BAD STATE OF THE ROADS—CACTUS-CLAD HILLS—ADOBE WALLS—VIEW OF THE CORDILLERA—BOTANY OF QUEBRADAS NEAR VALPARAISO—PROCEED TO COQUIMBO—STERILE ASPECT OF THE COUNTRY—PLANTS—SHELL-BEDS—DREDGING—TERRESTRIAL AND MARINE ANIMALS—EARTHQUAKE SHOCK—NEW TUBULARIA — EXCURSION INLAND — SAMO—OVALLE—TORRE—TAMAYA—PANULCILLO—INDIAN GRAVES—GIANT HUMMING-BIRD—CAMARONS—RETURN TO VALPARAISO—DIEZ-Y-OCHO—PLANTS—EXCURSION TO SANTIAGO—MUSEUM—VALDIVIA'S HOUSE, ETC.

THE morning of the 12th was bright and sunny, though rather chilly, and on coming on deck we naturally gazed with a considerable amount of interest on the surrounding scene, which was new to most of us, and destined to serve as our winter quarters for the next three or four months. I must confess that my first impressions of the city and surrounding country were those of great disappointment. I suppose I had formed extravagant ideas of the attractions of Valparaiso, from the various accounts of it which I had heard, and was surprised to behold a shabby-looking large town, the main streets of which straggled along a narrow strip of ground at the foot of a bare, rugged, steep, saddle-backed, reddish-coloured range of hills upwards of 1400 feet in height, furrowed with numerous narrow ravines or quebradas, with their sides piled up with dwellings of a very mean description of architecture, tenanted chiefly by the

poorer part of the population. In the Channels trees were rather in excess; but here, wherever we directed our gaze around the sides of the bay, we beheld an entire destitution of vegetation higher than low shrubs, with the exception of a very few trees in the gardens of some houses situated near the top of one of the hills, the Cerro Allegre, and which we afterwards learned were chiefly tenanted by English merchants. But if there is little that is interesting or attractive in the immediate vicinity of the city, there is amply sufficient in the distant prospect to satisfy the observer's sense of wonder and beauty; for on casting the eye eastward on a clear day, he will see the horizon bounded by the snow-clad range of the Andes, including the magnificent precipitous mass of Aconcagua, upwards of 23,000 feet in height, and generally regarded as the highest mountain of the New World. We were favoured with a large amount of clear weather during the earlier part of our stay, and day after day I watched with unabated interest these "silent pinnacles of aged snow," as they stood "sunset-flushed," the tints varying from a delicate pale blush to crimson with blue shadows.

Undoubtedly the two great drawbacks to Valparaiso, as a port, are the depth of the anchorage and its entire openness towards the north, thus affording no shelter to the shipping during the winter months, when violent northerly gales prevail, producing a very heavy sea in the bay, and frequently causing much damage to merchant vessels by driving them on shore. These "northers," as a rule, last from one to three days; and from our experience of them, I have no hesitation in stating my opinion that, as regards the discomfort they occasion, I would quite as soon be at sea as in port during their continuance.

There was a considerable amount of merchant shipping

in the bay on the morning of our arrival, as well as representatives of the navies of most European nations—Great Britain furnishing, in addition to ourselves, the "Pylades," "Malacca," and "Nereus," the last a large vessel of the antique type, permanently maintained at Valparaiso as a store-ship. The forenoon was fully occupied in the perusal of a large supply of letters from England, which we found awaiting us, while in the afternoon many of us landed to inspect the city. The streets were much narrower, and appeared much shabbier in general aspect, than those of Monte Video; while the shops, as a rule, were poorer looking, and nearly all the articles contained in them were extravagantly dear—upon an average, I should think, twice as expensive as at Monte Video, and four times more so than in England.* A ferro-carril, or iron railway, is laid down through some of the principal streets, and upon this numerous omnibuses drawn by two horses run, so as to make a circuit of the lower part of the town, the terminus being at a railway station at one end. Some of the buildings still bore evidence of the Spanish bombardment about a year previously, the custom-house being yet in ruins, and cannon-balls sticking in the walls of some of the houses. The churches, like most South American edifices of the kind, are exceedingly poor as regards architecture, stucco largely prevailing in the interior, and the spires in general being constructed of wood—in one instance painted green! The population seemed to be pretty equally divided between English, Germans, and Chilians; and the excessive fondness of the last mentioned, alike young and old, for sweetmeats,

* I may mention, as a good example of the prices we required to pay for comparatively inexpensive articles, that a quire of stout blotting-paper cost me two dollars and a half!

was evinced by the inordinate amount of confiterias, or confectioners' shops, as well as the numerous stalls devoted to the same purpose at the corners of the streets. Many of the manners and customs of the Chilian part of the population, which afterwards became so familiar to us as not in any measure to attract our attention, struck us on this occasion as peculiar; and among these I may instance the predilection which appeared to prevail among the male portion of the community for enveloping their necks in huge comforters, a habit which somewhat oddly contrasted with that possessed by the ladies of walking bonnetless about the streets. The "vigilantes," or policemen, formed also a conspicuous feature, as they marched along in their uniforms with swords by their sides. At night the streets resound with the noise of the bone whistles which they carry, and blow as signals to one another. As far as I could learn, they do not appear to be regarded as by any means a very efficient body.

On the following day (12th) we drove in one of the omnibuses on the ferro-carril to a public garden near one end of the town. It being winter, and the climate extra-tropical, most of the trees were comparatively destitute of leaves, and many of the plants were out of flower. Some handsome Acacias were, however, in full bloom, and about these a number of humming-birds were flying. This garden appeared to us but a poor affair at the time of our first visit, but farther on in the season it often became the terminus of our afternoon walks; and two or three months later many fine plants were in flower, including various handsome *Malvaceæ*, *Magnoliaceæ*, *Apocynaceæ*, and numerous representatives of other orders, among which I may mention the Floripondio, *Datura* (*Brugmansia*) *arborea*, a tall shrub, much cultivated in Chili on account of its large, drooping,

fragrant, trumpet-shaped white flowers. A closely-allied and even handsomer species (*D. suaveolens*) forms one of the glories of the gardens at Rio, attaining a height of ten or more feet, and being covered with drooping white blossoms, which sometimes exceed nine inches in length. This day we also visited the market, held in a large covered building. Oranges, pears, and small purple grapes, were the prevalent fruits; and there was also a considerable number of the cherimoyer (*Anona cherimolia*), which is rather extensively cultivated in Chili, and, were it not for the size and number of its seeds, would, I think, be one of the finest fruits in existence, the pulp tasting much like strawberries and cream. The exterior is of a dull greenish colour, appearing as if covered with large polygonal scales.

On the 14th, Dr. Campbell and I landed to take a long walk into the country, driving in one of the omnibuses to where the road leading out to Santiago begins, and, after following it for a short distance, striking into a little valley, through which a small stream runs. We had not gone far before we recognised the characteristic foliage of the castor-oil plant (*Ricinus communis*), which we had seen already both at the Cape de Verdes and Rio de Janeiro; and soon afterwards we observed numerous bushes of a species of *Fuchsia* which was new to us. This, the *F. lycioides*, formed a low, rather stiffly-growing shrub, with its branches covered with small leaves, and rather insignificant pale rose-coloured flowers, grouped closely together. On the banks of the stream several shrubby plants abounded, the most prevalent being a Myrtaceous bush (*Eugenia stenophylla*); several Compositæ; the "Colliguay" of the Chilians (*Colliguaya odorifera*), a Euphorbiaceous under-shrub abounding in milky juice, and bearing hard three-lobed capsules; and the "Quilo" (*Muhlenbeckia sagittæfolia*), one of the *Polygonaceæ*,

the small fruits of which are much esteemed by Chilian children, while the roots are held in repute by their parents, who employ them as medicine; a small yellow-flowered *Calceolaria;* an *Oxalis*, with a short, thick, decumbent stem, fleshy leaves, and yellow flowers, occurring on rocks; wild potatoes, and the *Cuscuta* seen at Lota, as well as several species of ferns, including a fine *Adiantum*,* were also abundant; and we were pleased by finding at one spot *Viola odorata* in flower, doubtless escaped from some garden. On subsequently ascending some steep rounded hills, we noticed many specimens of a *Cereus*, growing from ten to twelve feet high, and armed with very strong spines; and bushes of a strong thorny *Adesmia*, with yellow flowers and very small pinnate leaves, the *A. microphylla*, abounded; while the short herbage on the summits was golden in many places with the flowers of the little *Oxalis lobata*, or "Flor de la perdiz" of the Chilians; and here and there the old blackened flower-stems of a remarkable plant of the pine-apple order, with long leaves armed with ferocious curved spines, the *Puya coarctata*, formed conspicuous objects. After crossing various low hills, and intervening narrow quebradas, we at length got down to the beach at some miles' distance from the town; but as the tide was high, and a surf breaking, the only objects observed by us were numbers of dead shells of *Concholepas*, the inhabitants of which had served as a repast to people in the neighbourhood. We then followed the line of railway for some distance, paying a short visit to an extensive slaughter-house, which presented a most repulsive appearance, and finally wended our way into the town.

On the afternoon of the 18th I walked with several of the

* On the west coast of South America no representatives of this genus were met with south of Chiloe.

officers to look at a raised beach beyond the forts to the N.W. of the town. It was, as nearly as I could calculate, about seventy feet above the present sea-level, and abounded in shells all apparently belonging to existing species, *Fissurellæ* and *Concholepades* being the prevailing forms. As, however, I could see no good sections, I could not ascertain what was the thickness of the shell-bed, and I was not without a lurking doubt that the collection of shells might be rather due to an old "Kjokkenmödding," than to an elevation of the land. We subsequently descended to the sea-beach, where I spent a short time in search of marine animals, but was not particularly successful, owing to the circumscribed nature of the field of my investigations; for although it was low tide, not more than five or six yards of the rocks were accessible, even by wading. At high-water mark hundreds of a *Littorina*, the *L. zebra*, with a pretty white striped shell, were congregated, and further out I found specimens of *Monoceros glabratum*, and several *Fissurellæ* and *Chitons*. After I had finished my explorations we continued our walk for some distance along the heights to the N.W., meeting on the way an old man who had been fishing for large *Echini*, of which he had obtained a basketful, for food. The instrument by which he obtained them consisted of a long pole, with a number of little sticks attached to one end of it in a circle.

The following day (19th) three of us landed in the morning, and having procured horses, rode out, under the escort of one of the officers of the "Nereus," to the Placilla, a broad flat valley, about seven miles distant, on the route to Santiago. Our route lay chiefly over the top of low treeless hills, covered with a red soil, and dotted with low shrubs such as the Boldu, and a Leguminous plant of the tribe *Sophoreæ*

(*Edwardsia Chilensis*), together with the *Cereus* previously mentioned, and various aromatic *Labiatæ*, and commanded a magnificent view of the Andes, which were very clearly displayed on this warm, bright day. On reaching our destination we put up our horses at the post-house, and then set out on a walk of about a couple of miles to see a waterfall in a very remarkable deep narrow gorge. On the way we saw several specimens of *Sturnella militaris*, and some small finches, one of which, the *Zonotrichia matutina*, is as common about Valparaiso as the house-sparrow is in England, and bears a considerable resemblance to it; and I also noticed a variety of plants, among which a purple-flowered Labiate, with an odour of thyme, the *Gardoquia Gilliesii* was the most prevalent. We found the waterfall very small, owing to the absence of rain for some time past, and after contemplating it, returned to the post-house, and had a substantial luncheon, of which the national "casuela," an excellent soup formed of fowls, eggs, and vegetables, boiled together, formed the principal part. We then remounted, and rode back to Valparaiso, following a different and very striking road which wound along the sides of the hills. On the way we observed numerous specimens of a low palm * of ungraceful appearance (owing to the bulging of its stem in the middle), which yields a sweet sap used as sugar; and we met numerous specimens of the characteristic Chilian waggons, covered with dome-shaped roofs of ox-hide, and drawn by teams of oxen. The team generally consists of from eight to twelve animals yoked together in pairs, the yoke being formed of a thick, stout, heavy wooden beam, one extremity of which is secured immediately behind the horns of the animal, and each yoke

* Formerly regarded as *Jubæa spectabilis*, but now, I believe, recognised as a distinct genus under the name of *Micrococos Chilensis*.

being connected at the middle with the following one by a length of stout hide-rope. The oxen are in general very handsome and powerful-looking animals, with fine horns. They are urged along by a goad formed of a stick six or seven feet long, with a nail attached to one end. This the drivers use very dexterously, digging it into the animals so as to guide them with great precision.

The 21st was our first Sunday on shore at Valparaiso, the weather having been too bad on the previous one to allow of our landing. After attending morning service in the English church on one of the hills, some of us whiled away our time in the inspection of the Protestant and Roman Catholic cemeteries, which lie side by side. It was amusing to observe how the taste for turgid and ridiculous inscriptions, so marked in cemeteries and churchyards in Great Britain, was maintained abroad, contrasting strangely with the touching simplicity and pathos displayed in most of the German epitaphs, which generally began with "Hier ruht," which will be admitted to be an improvement upon "Here where this silent marble weeps," and such like effusions. Many of the Roman Catholic tombstones had photographs of the deceased covered with glass built into them, and there were likewise many devices indicative of the employments of those buried underneath. As respects cessation of labour on Sundays, Valparaiso has decidedly the advantage over Rio, probably owing to most of the principal shops and warehouses being in the hands of English and Germans. It does not, however, appear to be much of a day of rest on board the Chilian ships of war; for the unfortunate brass bands, at all events, seemed to do double duty on Sunday, clashing away, with hardly any intermission, from morning to night.

On the 23d we had our first experience of a regular

"norther" in the bay, and most unpleasant it was, the vessel rolling and pitching as badly as if she had been at sea. The 26th I devoted to the exploration of various small quebradas in the neighbourhood of Valparaiso, in search of plants, but owing to the season did not obtain many species. The principal found were the beautiful large white Mexican poppy (*Argemone Mexicana*), an *Escallonia* (*E. rubra*) nearly out of bloom, and many specimens of the "Anenuca" (*Habranthus hesperius*), an Amaryllid widely distributed in Chili, the flowers of which vary much in colour—shades of orange, crimson, and scarlet being the most common. I passed many carcasses of mules and horses in various stages of decay, and observed, rather to my astonishment, a group of hens feeding on the flesh of the leg of a mule.

On the 1st of July two of the officers and myself started on an excursion to the small town of Santa Rosa, in the province of Los Andes, situated at the foot of the Cumbre pass leading through the Cordillera. We had been anxiously hoping for suitable weather for the trip, and were favoured with a very fine day, not particularly bright, but remarkably clear. On arriving at the railway station, we took out tickets for Llaillai, about fifty miles or rather more distant, and nearly midway between Valparaiso and Santiago, the Chilian capital. The train left at ten A.M., and soon after, when we had left Valparaiso some distance behind us, we observed a decided improvement in the features of the country, the low hills and valleys being much more richly clothed with verdure than those in the immediate neighbourhood of the city, and there being a larger proportion of tall shrubs and trees. Some of the land appeared very fertile, and droves of oxen and large flocks of turkeys were pasturing on the fields. At the station of Quillota, where we stopped for about ten

minutes, the carriages were besieged by vendors of fruit, consisting of grapes, oranges, apples, peaches, and lucumas. The last mentioned, the produce of a low tree of the order Sapotaceæ, we regarded as far from palatable, though it is highly esteemed by the Chilians. It is about the size of a small apple, of a rounded form, tapering slightly to the stalked extremity, with a green rind suggestive of that of a fig, enveloping a yellow mealy pulp, in consistence intermediate between the yolk of a hard-boiled egg and a potato, and enclosing two or three seeds shaped a good deal like those of the horse-chestnut. The number that some of our fellow-passengers managed to consume was surprising. We reached the Llaillai station soon after one o'clock, and on alighting proceeded to make inquiries as to the means of transit to San Felipe, a town in the valley of the Aconcagua, and about fifteen miles distant from Santa Rosa. Riding was the first idea that suggested itself to us, but was soon abandoned as impracticable, the road being feet deep in black mud; and, accordingly, after some deliberation, we engaged three places in one of two miserable, dirty, rickety old coaches, about the size of cabs, which we were informed were about to start for San Felipe. Our prospects of a safe arrival at our destination, the condition of the road which stretched out in front of us considered, did not appear of a very reassuring nature; but there being no alternative, we established ourselves in one of the vehicles; my companions with two Chilians occupying the inside seats, while I mounted the box beside the driver. The latter, a truculent-looking fellow, being anxious to accommodate a friend of his, endeavoured to persuade me, by dint of many entreaties in Spanish, to all of which I turned a deaf ear, to dismount and go inside, finally appealing to our two Chilian fellow-passengers as to the rights of the case. As they, however, took my part,

he at length sulkily yielded the point, and proceeded to harness the horses. In the meanwhile, the other coach got under way, and we watched its progress with much interest as it struggled along through the mud, which, in many places, came up as high as the axles of the wheels. Our horses appeared far from promising specimens, being lean, wretched-looking hacks, though, as we afterwards found, their aspect belied them, as they did their work remarkably well. Five were harnessed abreast to the coach, while a sixth was mounted by a lad who rode in front as pioneer, and in the worst parts of the road connected his steed with the coach by means of a rope attached to his saddle by one extremity, and hooking on to one of the shafts by the other. After a good deal of that necessary delay which seems to form an inseparable part of the Chilian character, we set forth. The first part of the route lay across the valley of Llaillai, and the state in which it was was sufficiently appalling. About twenty yards from the station was a Stygian pool of liquid mire between two and three feet deep, and a little beyond this, where the mud was more tenacious, several waggons had broken down, and their teams of oxen, urged by the goads of the drivers, were vainly endeavouring to drag them out of the slough. This of course added to our difficulties, as it left barely room enough to allow us to pass, and several times our horses were nearly down on their knees, but immediately dragged up, and energetically addressed with shouts of "Arriva-riva-riva," by our cuchero, who, though a ruffianly-looking individual, proved an excellent driver, so that we succeeded in avoiding any mishap. Before long we quitted the Llaillai valley, and began to ascend a road which followed a zigzag serpentine course up the side of a steep hill or "cuesta." Here we overtook the other coach, passing it to our satisfaction, and meeting various waggons

going in the opposite direction, there being just space sufficient, with skilful driving, to allow of our passing them without pitching down the steep bank into the valley below. After a time we gained our highest point in a hollow between two hill-tops, and halted for a few minutes to rest the horses, allowing us to gain a view of the valley of Llaillai behind us, and that of the Aconcagua in front. Into this latter we now began to descend, the road continuing good while it kept on the sides of the hills, but on reaching the bottom of the valley becoming as bad as ever. We then drove along at the foot of hills bristling with Cacti (*Cereus Quisco*) growing from twelve to eighteen feet high, and armed with spines from two to five or six inches long, their strange candelabra-like forms frequently rendered of a vivid crimson hue, in consequence of being thickly covered with the red flowers of a leafless epiphyte, the *Loranthus aphyllus*. The road was bounded on either side, in many places for miles at a time, by rows of tall Lombardy poplars, and up the stems of many of these a Bignoniaceous climber, the *Eccremocarpus scaber*, ascended to a considerable height, its handsome red blossoms here and there producing a bright patch of colour. On we went, bumping and plunging, the coach often forming a very acute angle with the road, into the mud of which we appeared in imminent danger of being capsized, with the fertile flat plain of the valley on one side of us, stony hills supporting hardly any other vegetation but Cacti on the other, and in front, several jagged black peaks thrown out in striking relief by the snowy chain of the Andes behind them. Now and then we passed a group of mud-hovels, destitute alike of windows and chimneys ; and at intervals, broken-down waggons, with a number of peons attired in brilliantly striped ponchos, endeavouring to make the oxen drag them out of the mire by dint of savage

yells and proddings with their long goads. At one place, where a waggon had sunk on one side above the axle of the wheel in the mud, twelve oxen were in vain struggling to drag it out, urged on by about as many men armed with goads, the scene appearing like a species of battle. All this time we were ascending, though very gradually, towards the Cordillera, and by-and-by we flanked the jagged hills in front. About half-way to San Felipe we changed horses, getting five strong white quadrupeds which behaved admirably. The driver, who some time previously had been mollified by the judicious administration of a little cognac, now laid himself out to be agreeable, and he and I held much conversation, with I fear a rather misty conception of each other's meaning. He farther displayed his accomplishments in driving to the fullest extent whenever we came to a good piece of road, giving a wild yell which had the effect of making our steeds set off at full gallop, and as they were all harnessed abreast, they presented a rather remarkable spectacle, tearing along with the old coach behind, which must have been of strong material not to dissolve into its constituent elements. As we drove along we passed near the openings of several copper and silver mines, one of the latter of which we were informed was one of the richest in Chili, and at a short distance from San Felipe we forded the river Aconcagua. Arrived at San Felipe, we dismounted at a hotel on one side of a large Plaza planted with rows of trees, and after consultation agreed on pushing on to Santa Rosa that evening so as not to break into another day. We found that one of our companions, a most good-humoured elderly gentleman, was likewise going, and therefore engaged our places in the same coach, and set out without loss of time. Just as we left the town, we became spectators of one of the most glorious

effects that I have ever witnessed. The day, though clear, had not been sunny, so that, although the snowy heights of the Andes had been distinctly visible throughout the greater part of our journey, they had not been illuminated by the rays of the sun. But now, as we turned the corner of a street, the chain of the Cordillera suddenly burst on our gaze in such a blaze of splendour that it almost seemed as if the windows of heaven had been opened for a moment, permitting a flood of crimson light to stream forth upon the snow. The sight was so unexpected and so transcendently magnificent that a breathless silence fell upon us for a few moments, while even the driver stopped his horses. This deep red glow lasted for three or four minutes, and then rapidly faded into that lovely rosy hue so characteristic of snow at sunset among the Alps.

As usual, however, there was but a step from the sublime to the ridiculous, for the light failed rapidly, and we bumped and rattled along a road strewn with large rounded stones, apparently deposited by the Aconcagua in a state of flood. Fortunately, it was a moonlight night, or there might have been some chance of our journey terminating nowhere in particular. We had bought some bread at San Felipe, as we had fasted since the morning, and this we now essayed to consume with the adjunct of a little cognac, a vast amount of difficulty being encountered in making your flask reach your mouth without chucking yourself on the chin with it, hitting your nose, or capsizing the precious liquid. Our Chilian companion was in a state of great hilarity over our rough method of progression, and asked us many questions as to who we were, and why we were going to Santa Rosa. On our telling him that we had spent two seasons in the Strait of Magellan, and that before long we were going back again, he ejacu-

lated "Caramba!" with great emphasis. He informed us that there was a good French hotel at Santa Rosa, and kindly volunteered to go with us, and introduce us to the landlord thereof. We stopped for a few minutes at a house by the wayside at his request, as he wished to see some friends there; and presently a man appeared at the coach-window with a great tumbler of "aguardiente," an intensely fiery spirit, tasting strong of anise-seed, which he presented to us in the most polite manner. We of course tasted it for civility's sake, but rather astonished him by not drinking it right off. This ceremony over, we again set forth, and reached Santa Rosa about seven, alighting at the French hotel, "Hôtel Colon," on one side of a large Plaza, planted with four rows of trees. Here we were introduced to the landlord, who shook hands with us very cordially; and as one of our party was an excellent French scholar, we were soon on the most agreeable terms. Our friend then took his leave, and we sat warming our feet over a charcoal brazier, as we were somewhat cold after our long journey, while dinner was being got ready for us. On making inquiries from our host as to the sights of Santa Rosa, he recommended us to ride on one of the following days to the top of a steep hill in the neighbourhood, named "Il Cerro de los Indios," from being the last place in this district where the Indians had held out, and from whence they made raids on the neighbourhood, telling us that the view from the top was esteemed very fine, and volunteering to be our guide thither. After talking for some time, we retired to rest. The bed-chambers were ranged round a court paved with round stones, like a stable-yard, and opened directly upon it. They possessed no windows properly so called, being lighted from the doors, the upper parts of which were formed of strong parallel iron rods, with inter-

spaces about four inches wide, so as to present a rather prison-like appearance. These interspaces were not glazed, but hinged shutters were attached on the inner side of the door, and closed at night to exclude the cold. We found rooms and beds alike remarkably clean and wonderfully comfortable, and altogether, from our experience of this hotel, I can strongly recommend it to the attention of visitors.

The morning of the 2d was remarkably fine, being clear, cool, and invigorating. After an early breakfast we spent an hour in a vain attempt to procure horses or mules, only succeeding at last in arranging that we should be supplied with them on the morrow. We thereafter resolved on strolling out along the road leading into the Cumbre Pass, and spending the day in the open air. Leaving the town, we slowly wended our way along a road following the course of the river Aconcagua, and bounded on each side by low walls of "adobè" (sun-dried bricks made of mud and straw, and frequently of very large size. Some which we saw were at least three feet long, by a foot broad and two feet thick.) These walls were thatched on the top with brushwood, to prevent the rains washing them away, an arrangement which communicated to them rather an odd effect. We passed a vineyard, where the people were engaged in bruising the purple grapes in a kind of winepress for the manufacture of "chicha," or some kind of country wine. The bunches of grapes were heaped on a sort of hurdle made of saplings, laid on the top of a vat of bullock's hide placed on the ground in an inclined plane. The men bruised the bunches over the hurdle, so that the pulp, juice, and a considerable part of the rind also, were squeezed through into the vat below, where they formed a large mass on which numbers of bees

were crawling about. From this mass the juice distilled, flowing in a stream through an opening at the lower end of the vat into a wooden tub sunk in the ground. On tasting the juice in the tub, we found that it possessed no flavour but that of sweetness. At some distance beyond the vineyard we passed a remarkable suspension-bridge over the river, at one end of which was a hovel, with walls formed entirely of reeds and saplings ; and farther on we noticed many more habitations of an equally primitive description. Three methods of building seem to prevail among the dwellings of the lower classes in the country. In the first, the walls are formed of adobè bricks, in the second of saplings plastered with mud, and in the third of saplings with the interstices left open. About noon we ascended a hill of about eight hundred feet in height, for the sake of the view to be gained from the summit, which was very fine. The tall *Cereus* abounded everywhere on the hills ; and on cutting out pieces from the circumference of some of the plants with a pocket-knife, I observed an abundance of sphæraphides, which fell out like little white grains of sand. On the parasitic *Loranthus*, I found many examples of an insect apparently allied to *Coccus*, with a thick gummy secretion covering the dorsal surface. After descending this hill, we continued to follow the road for some miles, at length leaving the mud walls behind us. As it was winter, very few plants were in bloom, a pretty purple-flowered shrubby species of *Witheringia*, and a Leguminous shrub (*Psoralea*), with racemes of small bluish-white flowers, being almost the only specimens obtained. A characteristic feature of these mountain-roads was furnished by long cavalcades of mules carrying great hide panniers, the leader provided with a bell which tinkles as he goes. We spent some time watching with interest a couple of peóns

engaged in lassoing a wild ox, which made violent efforts to gore their horses, but was successfully captured without inflicting any damage upon them. On our way back to the town, as we were approaching a cottage, three men marched out to meet us with a hornful of liquid, which we were informed was "chicha" and which we were requested to drink. Complying with this invitation, we found the said chicha most refreshingly acid, and very grateful to our parched palates. We reached the hotel in time for the table-d'hôte at five o'clock. A number of people were gathered round the table when we arrived, and in a few minutes after, a self-important looking individual, probably the Intendente of the town, or some other local dignitary, came in, and took his place at the head of the table, all the guests, with the exception of ourselves, standing up to receive him. In conformity with Chilian customs, a large number of courses were handed round, some eight or nine at the least I should think, and the landlord, to do honour to his English guests, produced a bottle of Worcester sauce, which was examined by the other members of the company with much curiosity. Some hours later, our Chilian acquaintance of the day before came to pay his respects, and the artist of our party exhibited the sketches which he had taken that day. One of the spectators was a young Chilian, who spoke very good English, and gave us much information about the country, kindly offering, rather to my amusement, to furnish me with introductions to some of his friends in the neighbourhood of Chillan, although he was entirely ignorant of my name. After strolling about the Plaza for a short time, listening to the music of a very good military band, we retired for the night, anxiously hoping for a fine day on the morrow for our ride to "Il Cerro de los Indios."

Heavy rain fell during the night, and when we got up next morning, though it was fair, the sky was entirely veiled by a canopy of grayish-brown clouds, and the mountains were shrouded with mist. Presently rain began to descend again, but fortunately did not last long, and we set out on a walk before breakfast to consider the appearance of the weather, which showed symptoms of improvement. By the wayside I observed several bushes of a thorny *Acacia* (*A. cavenia*), with orange-yellow flowers. This species, which is known under the popular name of "Espino," is widely distributed in Chili, and from the hard compact nature of its wood, which takes a fine polish, is employed for a variety of purposes in carpentry. On our return to the hotel the landlord informed us that he thought we might as well attempt the proposed ride, and after a good deal of delay, caused by his equipping himself with a breech-loading gun of peculiar construction, and other sporting appliances, we mounted our horses and left the town, accompanied by a peón who acted as guide, and presented a most picturesque appearance, attired in the national costume of a poncho, with his feet in the great carved wooden triangular-shaped stirrups so commonly employed in Chili, and which weigh sometimes as much as two or three pounds. Our route lay through the valley for a time, after which we gradually ascended a range of hills, riding along their crest till we reached the Indian mountain. The sure-footedness of our horses was here put to the test, as part of the way lay along the sides of a very steep hill, where the track was so narrow and the ground so insecure, that it would have required some care even on the part of a pedestrian to maintain a footing. We found, after attaining a certain elevation, that the Cacti were succeeded by a variety of shrubs and low trees, a circumstance pro-

bably resulting from a more copious supply of moisture. The day gradually cleared up, and the view from the summit of the hill (about 1600 or 1700 feet above the level of the valley, which is, I should observe, between three and four thousand feet above that of the sea), was remarkably fine, as we saw at a glance the entire valley of the Aconcagua, extending green and fertile, here and there dotted with long rows of poplars and weeping willows, reminding us of pictures of the plains of Lombardy ; herds of sheep and cattle pasturing on the meadows, through which the silver thread of the Aconcagua wound its way ; while on every side towered up the snowy mountains, with their summits partially enveloped in mist, and long lines of cloud reposing half-way up their sides. A universal silence reigned around, only broken by the distant flowing of the river, and it seemed as if the valley was hushed to sleep under the shadow of the everlasting hills. In a little more than an hour we commenced the descent, which was so steep in many parts that we realised the advantages of the peaked Chilian saddles, without which it would have been difficult to avoid slipping over our horses' heads. In the evening our Chilian friend again came to see us, and we bid him good-bye as we were obliged to leave Santa Rosa next morning.

On the 4th we started at half-past seven A.M. for San Felipe, where we breakfasted (nearly all the dishes served to us tasting horribly of garlic), and then taking our places in another coach, began the return journey to Llaillai. We were unfortunate enough on this occasion to have a very stupid dilatory driver, and just as we had reached the top of the winding road leading down into the valley of Llaillai, we saw, to our dismay, the train from Santiago coming up in one direction, while that from Valparaiso approached in another. As we had been informed that the train only waited for a quarter

of an hour, we doubted much whether we would manage to catch it, and anxiously watched for any symptom of its moving as we rattled down the hill and plunged through the mud of the valley. Arrived at the station, we dashed out of the coach in between the two trains, and into an empty carriage, apparently much to the amazement of the phlegmatic Chilians, who were watching our movements. In a few minutes, as the train still remained stationary, we bethought ourselves of the advisability of procuring tickets, and one of the party then got out to endeavour to obtain them, running in the first place along to the engine and telling the stokers to "hold on the train," receiving in answer an "Ay, ay, sir," for the officials were English. Our object was successfully accomplished, and soon after we left Llaillai behind us, and reached Valparaiso at about five P.M., having enjoyed a most delightful trip.

Some days after this Dr. Campbell and I had a pleasant walk, under the guidance of two of the officers of H.M.S. "Topaze," over the hills behind Valparaiso, to some beautiful little green quebradas at the back of them. Here we met with several plants that we had not observed previously, as well as several old friends, among which was the handsome blue-berried *Citharexylon cyanocarpum*, so common in Chiloe, and the Winter's-bark (*Drimys Winteri*, var. *Chilensis*), which was flowering most luxuriantly. A barberry, with curiously palmated prickles (*B. actinacantha?*), a yellow-flowered *Ribes* (*R. punctatum*), an *Escallonia*, with the *Boldu*, the *Tupa salicifolia*, and the Litré (*Litrea venenosa*), were among the prevailing shrubby plants. The two last are both possessed of highly poisonous properties, the former abounding in a milky acrid juice, and the latter having the reputation of causing swellings on the bodies of those who gather it, or even sit

under its shade. Among the herbaceous plants noticed, were a white *Anemone*, the *Habranthus hesperius*, and last, but not least, the beautiful *Tropæolum tricolor*, which was just beginning to come into bloom. Later in the season its elegant twining stem and lovely flowers, coloured with yellow, scarlet, and dark purple verging on black, clothed many of the shrubs with a glory not their own. The day being splendidly bright and clear, we had a wonderful view of the distant Aconcagua, its glorious mass of glistening snow being displayed against a cloudless blue sky.

The remainder of July passed without any events specially worthy of notice, and on the 30th, shortly before noon, we left Valparaiso Bay for Coquimbo, whither three British men-of-war, the "Topaze," "Malacca," and "Mutine," had some days earlier preceded us. We encountered a considerable swell outside the bay, but had a very quiet passage, on the whole, keeping not far from the land, the coast-line of which is very bold and fine, the dark-coloured hills of the foreground contrasting finely with the snowy range of the Cordillera rising above them in the distance. The 31st was a beautiful clear day, and between three and four we rounded the rocky promontory which separates the small port of Herradura from the bay of Coquimbo, and entered the latter, passing not far from the Pajeros Niños rocks, on which a group of brown pelicans (*Pelecanus thagus*) were sitting with their heads resting on their breasts, while other individuals were employed in fishing about the neighbourhood. We anchored near the other British ships, off the town of Coquimbo, the vicinity of which presented a singularly sandy desert-like appearance, and here we remained throughout the month of August, enjoying delightful weather, and, thanks to the kindness of the English residents, passing the time very pleasantly.

The 1st of August was a fine, though rather hazy day, and in the morning Dr. Campbell, Mr. Gray, and I, landed, and took a long walk, finding the country remarkably dry and parched up, which was not surprising, as we were informed that no rain had fallen for eight months back. There were, however, some green patches of cultivated ground artificially irrigated, and consisting principally of "Alfalfa" (*Medicago sativa*), while in the distance various narrow tracts of verdure were to be seen, marking the course of streams in the little valleys between the hills. The hills, in most places, were covered with plants of a tall *Cereus*, much like that seen at Valparaiso and Santa Rosa, but branching more, and with weaker and more flexible spines, together with a species of humbler growth with bright purplish-red flowers. On the low undulating sandy ground, which stretches inwards from the sea for some miles, I found a considerable number of plants that were new to me, a few of which I may here briefly notice. A *Mesembryanthemum* (*M. Chilense*), with long trailing stems, fleshy trigonal leaves, and pink flowers, covered the ground in several spots in the neighbourhood of a line of railway, along which we pursued our way, and a Nolanaceous plant, a species of *Sorema*, with large blue convolvulus-like flowers, was also abundant on the sandy soil. Among the patches of "alfalfa," a very pretty little crucifer, the *Schizopetalon Walkeri*, with deeply pinnatifid white petals, and the beautiful *Schizanthus pinnatus*, occurred. A *Witheringia* here and there formed bright purplish-blue patches, and various species of Compositæ and Malvaceæ, and representatives of the genera *Eritrichium*, *Verbena*, *Heliotropium*, *Sphærostigma*, and *Fagonia*, were met with, as also a white-flowered liliaceous plant (*Leucocoryne alliacea*), smelling strong of garlic. Several species of birds were observed, one about the size of a wheat-

ear, and resembling that bird in its movements, being specially abundant, and we found a dead specimen of *Tinochorus rumicivorus*, which had apparently been killed by a hawk. A single individual of the Painted Lady butterfly (*Cynthia Carduî*), which we had already seen at Rio Janeiro, Monte Video, Lota, and Valparaiso, was captured, but very few insects occurred to us. I spent some time examining, with much interest, the beds of fossil shells, forming regular terraces, which extend for several miles inland, attaining an elevation of 250 feet, of which Mr. Darwin has given an account, and obtained numerous representatives of the genera *Oliva*, *Chorus*, *Monoceros*, *Concholepas*, *Turritella*, *Fissurella*, *Calyptræa*, *Ostrea*, *Pecten*, *Arca*, etc., most of them, apparently, belonging to existing species, as well as a portion of the pincer-claw of a large crab, several sharks' teeth, and many fragments of the bones of Cetacea. Some of these were found scattered on the surface of the rising grounds, and others were imbedded in a soft sandy rock, some good sections of which were displayed on the line of railway. A much older bed, which I subsequently observed, occurs a little above high-water mark, at the foot of a steep bank about fifty feet in height, at one end of the town of Coquimbo, and appears to be exclusively composed of large and massive oysters in a matrix of hard sandstone. The cardinal area of one of these shells, which I dug out on a later occasion, measured between five and six inches in depth. On leaving the shell-terraces, we descended to the sandy beach of the bay, where I picked up a few specimens of marine animals, including a live example of the *Oliva Peruviana*, which, on being handled, emitted a yellow fluid, which, on exposure to the air for a short time, changed to a rich purple hue; and a single individual of the *Hippa talpoides*, taken previously at Chiloe and in the Bay of San

Vicente. Many pelicans and gannets were flying about over the water, the latter disappearing below the surface in pursuit of their prey with the characteristic splash.

On the afternoon of the 6th, I walked, with two companions, over the rocky hills of the promontory which separates the bays of Coquimbo and Herradura, to the smelting works at Guayacan, on the coast of the latter. Our route lay through a rocky desert, abounding in tall branching Cacti, a species of *Cassia* with large bunches of orange-yellow flowers, and a shrubby *Oxalis*, the *O. gigantea*. The last plant, the Churco of the Chilians, attains a height of from three to six feet, and in those districts where it occurs its branches are often used as a substitute for laths in building houses. The bark is thick, and possesses a very astringent taste; the small trefoil leaves are acid, like those of nearly all the other species of the genus; and the flowers are of a lemon-yellow colour. Another plant, which specially attracted our attention, was an *Aristolochia* (*A. Chilensis*), with variegated leaves and curious tubular flowers of a lurid purple tint, covered in the interior of the tube with thick white hairs, with their points directed downwards. Their general form recalled that of the pitchers of *Nepenthes*, and they emitted a most offensive odour, suggestive of carrion. I was afterwards informed by a friend that the plant is esteemed among the lower orders in Chili as a remedy for small-pox. I also obtained specimens of the *Habranthus hesperius*, the *Tropæolum tricolor*, which was twining around the Cacti, a fine purplish-blue *Witheringia*, and a low shrub with curious green flowers, and a lobed bladdery capsule, the *Llagunoa glandulosa*, belonging to the order *Sapindaceæ*. At the smelting works we saw the process of running off the liquid metal in its second-last stage into moulds of sand, as had been previously witnessed by us at Lota.

On the 5th I had a walk of about sixteen miles with Dr. Campbell and an officer of the "Topaze," past Herradura Bay in the direction of Tongoi. The scenery had that desert-like rocky aspect so characteristic of the country, tall Cacti and the *Oxalis gigantea* forming the most prevalent features of the vegetation; while the occasional flocks of goats, wandering about and browsing on the latter plant, added materially to the peculiar effect of the landscape. Here and there the tall flower-stems of the *Puya coarctata* formed conspicuous objects in the distance. One of these, which we cut down, was about nine feet in height, the beautiful pale yellow, somewhat lily-like flowers forming a dense spike between three and four feet long. A rather curious, thorny, stiff-growing shrub, with abruptly pinnate leaves and bluish-purple flowers, seen for the first time, was the *Porlieria hygrometrica*, the specific name of which is derived from the property which the leaflets possess of closing and folding themselves upon the branches at sunset. We observed two fine condors soaring at a considerable elevation, and numbers of a grotesque-looking little bird, the "Tapacolo," *Pteroptochos albicollis*, were hopping out among the rocks with their tails cocked over their backs, and giving vent to a curious variety of notes. On the sandy beach of Herradura Bay I found several specimens of *Hippa talpoides* creeping rapidly along, as well as two dead individuals of the *Pseudocorystes sicarius* previously met with at Lota.

The afternoon of the 6th I devoted to the shell-beds, and obtained a good collection of the prevalent forms; and on the morning of next day a small party of us set out in the dingy, with the intention of shooting pelicans on the Pajeros Niños rocks at the entrance of the bay. We found, however, that unfortunately the surf was too great to permit of our landing

on the rocks, and the pelicans flew off before any could be procured. On another rock (Pelican Rock of the chart) a group of beautiful terns (*Anous inca*), with dark plumage, and a long white feather on each ear-covert, were sitting, and a couple of specimens of these were shot. We also obtained a specimen of a huge starfish (*Heliaster helianthus*), with thirty-eight rays, bearing a general resemblance to the British *Solaster papposa*. Later in the day we pulled far into the bay, which was alive with shoals of large and small fish, on which terns (*Sterna cassini*) and black petrels (*Nectris amaurosa*) were feeding, darting about in pursuit, and filling the air with their discordant cries. Now and then a pelican would sail past, its great bill giving it a most peculiar aspect, or a flock of gannets would suddenly appear not far from us, and dive into the water simultaneously after their prey. Several scissor-bills were also seen skimming along the placid surface of the bay, and one fine specimen was shot. We occupied some time in dredging, and brought up from the fine sandy bottom numbers of beautiful specimens of *Oliva Peruviana* and *Chorus xanthostoma*.

The neck of land already mentioned as separating the two bays of Coquimbo and Herradura was a favourite locality for an afternoon's ramble at this time. The yellow granitic rocks of which it is composed are most singularly disrupted, immense blocks of many tons' weight having been to all appearance violently torn from their original resting-place, and piled upon each other in the most picturesque confusion. Among them I met with several plants that did not occur elsewhere, among which was a species of a myrtle, and a plant whose name I forget, with the most deliciously fragrant flowers, recalling the odour of jasmine. On turning over the stones we were certain to meet with small scorpions,

which ran about, turning up their tails with intent to sting; and a handsome lizard (*Proctotretus Gravenhorstii*) of a bluish-green hue was very common, basking on the rocks, on which the sun was beating, sometimes associated with a smaller species, spotted with black (*Leiolæmus nigromaculatus*). On the rocks at the end of the peninsula, where the surf was almost always breaking with violence, great *Chitons* of two species, the *C. magnificus* and *aculeatus*, were to be seen in numbers, adhering firmly to the clefts and ledges, the latter frequently with an extensive growth of sea-weed on them; their collection being attended with a considerable amount of difficulty and danger. In less exposed situations, a species of sea-urchin, the *Echinocidaris nigra*, with a depressed shell three to four inches in diameter, and long purplish-black spines, was very abundant, adhering to the rock with much tenacity by means of its suckers.

On the 11th, in the course of a long walk of about eighteen miles inland through a gorge in a range of hills, I found a beautiful Nolanaceous plant of the genus *Alona* in profusion, forming a low shrub, with viscid leaves and branches, and exquisite blue convolvulus-like flowers, as well as a species of *Carica* (*C. pyriformis*), with very glossy green leaves. This plant abounds in a greasy milky juice, and its stem is so brittle as to admit of being broken across as easily as that of a cactus. Numerous flocks of a small dove were observed on this occasion, as well as one or two condors, and a specimen of the snake previously taken at Talcahuano was secured.

On the evening of the 13th, at about half-past six, while we were all seated at dinner in the wardroom, the vessel shook suddenly, as though she had received a blow. The same thing was repeated in the course of a few minutes, and

we thought it probably due to the shock of an earthquake putting a strain upon the cable. Soon after, the quartermaster on watch reported that the vessel was swinging round with a current of a force of from four to five knots. On hastening on deck to observe the phenomenon, no doubt remained that an earthquake had taken place, and that the current was due to the wave produced. At short intervals, the ship continued to swing rapidly round, and soon we heard shouts from some merchant-vessels at no great distance, which were anchored close to one another. On a boat being despatched to ascertain the cause of the disturbance, we learned that the vessels were fouling each other, so as to smash their topmasts and jib-booms. The surface of the water continued perfectly calm, but we heard the sound of a great wave breaking on the beach, and as there was no possibility of judging what might happen next, all the British men-of-war got up steam, to be ready to go to sea should matters assume a more serious aspect. Fortunately, however, the necessity for this did not arise, and, before next morning, the waters of the bay had assumed their normally placid condition. We learned that though the water had arisen about seventeen feet above the ordinary level, comparatively little damage had been sustained on shore, and that no shock had been experienced there. As may be readily imagined, we waited with anxiety for intelligence as to whether other portions of the coast had been equally affected; but it was not until some days after that we knew of the frightful catastrophe that had taken place to the northward, by which nearly 30,000 individuals in Peru and Ecuador had lost their lives, and an enormous amount of property had been destroyed. The earthquakes continued in force in these regions from the 13th to the 16th of August, many important cities being laid in ruins;

while in South Chili, Talcahuano, the seaport of Concepcion, was almost swallowed up by the wave. As, however, full details of the disaster appeared in nearly all the leading newspapers of Great Britain about six weeks later, I shall not attempt any further account of it.

On the 17th some specimens of a beautiful Tubularian polyp, procured on the copper of H.M.S. "Topaze," were sent to me, and a few days later the copper of the "Nassau" yielded additional examples of the same species, which being regarded by one of our highest authorities on the subject (Professor Allman) as hitherto undescribed, has been named by him *Tubularia polycarpa*. The afternoon of the following day, as the tide was very low, I devoted to a search for marine animals among the rocks at the entrance of the bay, and met with a considerable amount of success. Among the spoils obtained on this occasion, I may mention a small *Octopus* (*O. Fontanianus*), a specimen of which, discovered under a stone, was at first of a dirty grayish-white tint, but changed almost instantaneously to a rich dark purplish-red as the little creature swam off, tail first, with great rapidity and the directness of an arrow, propelled by the rapid movements of its arms. I also procured some very fine specimens of the *Chiton aculeatus* and *C. magnificus*, by dint of watching my opportunity as the wave retired, and rapidly removing them from the rock with the large blade of a clasp-knife. Two other species of the same genus, of smaller size, but very elegantly marked, which I found on this occasion, were the *Chiton Cumingii* and the *C. elegans*. Fine specimens of *Concholepas*, *Crucibulum ferrugineum*, etc., also abounded, and I further procured several Crustacea that were new to me, including a fierce crab of the genus *Grapsus* (*G. planifrons*), generally ensconced in deep narrow clefts, from which it was difficult to dislodge; several

beautiful *Porcellanæ* with broad flat claws, which they snapped off with the greatest agility on being handled, and many individuals of a beautiful prawn-like Decapod with a movable rostrum, the *Rhynchocinetes typus*, which were swimming about in the pools, their legs and bodies exquisitely banded with delicate shades of brown and red. A variety of star-fishes and *Echini* were also met with, as well as some very finely coloured *Actiniæ*, in which ultramarine blue, brilliant orange, emerald green, and white, were the prevailing tints. Many sponges also occurred, their colours varying from orange and yellow to light blue.

On the 19th I set out on an excursion inland with Captain Mayne and Mr. Gollan, H.B.M. Consul at Coquimbo, leaving the town by train at nine A.M. The country through which we passed presented the usual aspect of bare, burnt-up plains, with occasional green patches of "alf-alfa," succeeded after a time by cactus-clad hills. We at length arrived at the foot of a "cuesta," up which the train goes, and halted there for a time to take in luggage. As there seemed some likelihood of delay, I got out, and receiving the comforting assurance from the guard that he would not go on without me—a piece of attention not commonly to be met with in railway officials—I spent some time strolling about the neighbourhood, without however observing anything specially noteworthy. After nearly an hour had passed we resumed our journey, and the line, in ascending the "cuesta," being very remarkable from its excessive tortuosity and the steepness of the ascent (I believe in some parts as much as one in twenty-five feet), we took up our position on a platform in front of the engine to gain the full benefit of it. As we slowly wound about the hill, I noticed a variety of beautiful plants which I had not previously seen, and felt much tantalised at being unable to pro-

cure them. The "cuesta" passed, we proceeded onwards to the railway station at "Higuerita," where we were met by a gentleman (Mr. Hamilton) who had kindly undertaken to act as our *cicerone* on the trip; and after we had partaken of a substantial breakfast or luncheon provided by a hospitable Chilian, we mounted our horses, which we had brought with us from Coquimbo, and rode off to Samo, a farm about twelve miles distant, in the valley of the Rio Hortado, in the hands of a Chilian gentleman, Señor Sasso. After riding for the greater part of the way along a winding road, and crossing two streams (a sufficiently rare phenomenon in this parched-up district to be worthy of notice), we ascended to a sort of table-land, which we crossed, descending thereafter by a winding road into the valley of the Rio Hortado, which, though sufficiently arid-looking regarded as a whole, possesses a green tract extending on either side of the stream from which it derives its name, and which on this occasion presented an attractive appearance, from the various shades of the foliage of the willows, olives, and myrtles fringing its banks, and the lovely pink glow of the peach-blossom in the orchards. We reached the farm about five P.M., and passed some time roaming about in the neighbourhood of the stream, two of the party carrying guns in quest of snipe. A few of these birds were seen flying about at a considerable elevation in the air, as well as some "zorzals" (*Turdus fuscatus*) and "tortillitos" (little doves), but they were all very shy, so that few were obtained. Before long Señor Sasso made his appearance, and we were then conducted by him to his house, which, with the farm-offices, occupies three sides of a large square, and installed in the guest-chamber, provided with four iron beds ranged around the walls. Refreshments in the form of beer and cognac were brought to us, and soon after we were

summoned to a very excellent dinner, with only too many courses, and treated to some very good light wine, manufactured at Santiago, and known under the name of Ochagavia. After dinner we adjourned to the "salon," where we spent the rest of the evening, the young ladies of the house contributing to our entertainment by playing on their guitars, and some of the members of our party being induced to take part in the "Zamecuaca," the national dance of Chili. The evening was terminated with a song improvised as a welcome to the visitors, whose Christian names were introduced and celebrated with a variety of compliments.

Next morning we left the farm on our way to Sauce mine, the property of Mr. Hamilton. Following the course of the valley, between one and two P.M. we reached a very pretty farm the name of which has escaped my memory, where we breakfasted and remained for about a couple of hours, investigating the garden and vineyard appertaining to it. The vine-stocks were very old and gnarled, and the young wood does not appear to be trained, as is generally the case in Europe, so that at a distance a vineyard of this sort looks much like an orchard of stunted old apple-trees. We then rode on to Pangue, a farm close to the bank of the stream running through the valley. Here we dismounted and remained for a short time, being shown the apparatus used in the manufacture of "chicha" the national beverage. Some enormous earthenware jars, employed for holding the fluid, had been in use, we were informed, for 150 years. They were about five feet in height, by between three or four in diameter, the mouth, which was furnished with a lip, being about a foot and a half wide. At this place there was a beautiful orchard, carpeted with sweet violets, and filled with peach-trees in full blossom. On leaving Pangue we followed

a curious winding road leading up some hills for nearly 2000 feet to the mine, where we were to spend the night. In the course of our ascent I observed several specimens of a curious *Echinocactus* which was new to me. It was of a nearly spherical form, like a large deeply-ribbed gourd, bristling with spines, and from nine inches to a foot in height. The mules, I was told, when suffering from thirst, often strike off the spiny rind with their hoofs, and eat the watery succulent pulp. It was a beautiful evening when we reached our destination soon after sunset, and shortly after we had dined we retired to rest.

The morning of the 21st was gloriously bright and clear, and after inspecting the copper of the mine we mounted our horses and rode down the hill. On our way we passed within a short distance of three parrots, banded with brown and yellow, which were perched on a *Cereus*, and screeching discordantly. Unfortunately there was no gun ready, and they accordingly escaped without injury. As before we reached Samo, a distance of about eighteen miles, our horses showed signs of fatigue, and the day was rapidly wearing on, we determined on spending another night there before proceeding onwards to our next stage.

On the 22d we left Samo at seven A.M., accompanied by our kind host, who wished to introduce us at a farm named Torrè, where we designed to make a halt at noon. Ascending the winding road which led us down into the valley on the 19th, we crossed an elevated plain nearly as flat as a board, and from thence descended into the valley of Ovalle. We rode through the town of that name, which appears rather a flourishing one, possessing about six thousand inhabitants, and alighted for a short time in the principal Plaza, where a guanaco was tethered. The signs over some of the doors of the shops were very eccentric, a large blue mermaid figuring

over one, and a carnivorous animal of appalling aspect, perhaps intended as a representation of a jaguar, over another. After following for some distance the course of this valley, which appeared much more fertile than that of the Rio Hortado, we crossed over a low singularly narrow ridge into the large and beautiful valley of the Limaree, which I was informed was almost entirely in the hands of one proprietor, who, by judicious speculations, had attained to great wealth. Here I observed many specimens of two birds which I had not noticed in the immediate neighbourhood of Coquimbo—namely, the Turco (*Pteroptochos megapodius*), a very odd-looking creature, somewhat like a gigantic wren, which hops about, cocking up its tail, and giving utterance to a variety of strange noises, and a kind of starling (*Agelaius thilius*) with bluish-black plumage and a yellowish-white patch on the shoulder. We reached the farm of Torrè (so named from two curious monuments, believed to be of Indian origin, situated upon it) soon after noon, and experienced a most hospitable reception from the owner, Señor Lucas Valdivia, a brother-in-law of Señor Sasso's, and a fine-looking man, with very dark eyes and long black hair and beard. While breakfast was being prepared, we went over the garden and large vineyard; and thereafter we strolled about for some time inspecting the live stock. We then remounted our horses, and bidding farewell to Señor Sasso, who returned to his own home, rode on to visit the celebrated Piquè mine at Tamaya. The greater part of our route lay along an extraordinary zigzag path winding up the side of a very steep hill, from the summit of which we gained a commanding view of the Limaree valley. We then descended the other side of this hill for some way, keeping not far from the marvellous serpentine line of the railway, which conducts the copper from

the mines at Tamaya to the bay of Tongoi, some distance to the south of Coquimbo. As we rode along we gazed with astonishment at the extraordinary aspect presented by the precipitous Piquè mountain, with its mines, winding zigzag paths, and long rows of whitewashed miners' houses, which, placed at various elevations, presented exactly the appearance of fortifications. A gradual ascent brought us at length to the Piquè House, belonging to the proprietor of the mine of that name, and remarkably situated at the top of a steep precipice, at an elevation of 3800 feet above the level of the sea. Here we remained for the night, being very kindly received by a German gentleman, the cashier of the mine. The following morning was at first misty, but before long cleared up to a bright sunny day, and the view from this elevated situation was of a most remarkable character. The small garden perched on the top of the cliff in front of the house overlooks a large deep valley covered with a reddish soil bare of vegetation, and surrounded by an amphitheatre of hills in the form of a horse-shoe, of which the Piquè mountain forms the central and highest part. Beyond this desert valley extends the green fertile tract of the Limaree, and this is in turn succeeded by range after range of hills, the view being at last bounded by the snowy wall of the Cordillera. The morning was occupied in the inspection of the works at the Piquè mine, which, I believe, produces the richest quality of copper ore in the world; and early in the afternoon we took our departure, riding over to Panulcillo, about sixteen or seventeen miles distant. Here, where we were cordially welcomed by the managing partner of the mining company, we spent a very pleasant evening, and in the course of the following forenoon visited the celebrated copper-mine of Panulcillo, exploring part of it under the guidance of the captain of the

mine. The vein, though not a rich one (the ore in most places yielding I believe not more than nine or ten per cent of pure metal, while that of the Piquè mine yields from thirty to upwards of fifty), is very large, being as much as sixty feet wide in some places where it has been worked. On raising the lamps with which we were provided, we could clearly perceive that the walls of the mine were glistening with the yellow metal. Early in the afternoon we left Panulcillo by train for Coquimbo, and reached the port about five P.M. On getting on board, I found that, as usual, during my absence, a variety of specimens had been collected for me, including some beautiful Crustacea, among which was a very fine specimen of the *Hepatus Chiliensis* and other marine animals, as well as a sooty albatross (*Diomedea fuliginosa*), which was tied by the leg to the rails of the bridge.

The following afternoon a seining-party was despatched from the vessel, and by this means I reaped some benefit, obtaining specimens of a pipe-fish, *Syngnathus acicularis*, and of a curious parasitic crustacean, the *Cymothoa Gaudichaudii*.* On the 27th, Captain Mayne, Dr. Campbell, and I, proceeded by train to Compania, and from thence had a very agreeable ride to visit some old Indian graves, under the escort of Mr. E. F. Ffrench, a gentleman possessed of great scientific talents, and whose kindness in furthering my researches and observations, not only during our stay at Coquimbo, but since my return to this country, I desire very gratefully to acknowledge. The greater part of our way lay over a succession of low hills, on which I noticed a variety of plants that were new to me; among others, a curious

* A few days later I obtained from some fishermen fine specimens of two remarkable Crustacea, the *Platymera Gaudichaudii* and *Gonodactylus styliferus*.

greenish-flowered Orchid, the *Bipinnula mystacina*, with some of the segments of the perianth remarkably fimbriated. After visiting the Placeres copper-mine, we spent some time excavating graves for skulls, but without very great success, and then rode on to Brilliador, the oldest mine, I believe, in Chili, where we were very kindly received by Mr. Bennett, who works the vein. Some days later, in the course of another excursion among the hills in the neighbourhood of Compania in Mr. Ffrench's company, I obtained some fine specimens of the giant humming-bird (*Patagona gigas*). Mr. Darwin has well remarked of this species, that "whilst hovering over a flower, it flaps its wings with a very slow and powerful movement, totally different from that vibratory one common to most of the species which produces the humming noise." While flying about, its motions reminded me of those of a swallow.

On the 29th of August I had a ramble in the neighbourhood of Serena, walking down to the sea-beach, where I found hundreds of specimens of a bivalve, the *Mesodesma donacium*, lying. In some fresh-water marshes I noticed two men wading about waist-deep, apparently in search of something, and on approaching them, to inquire what they were doing, I was informed they were catching "camarōns," a large species of prawn (*Palæmon cæmentarius*) of an olive-green colour, and provided with large claws. The capture of these animals was carried on by one of the men holding a wicker-work basket, into which the other shook armfuls of weeds which he pulled up from the bottom of the water. The prawns were then picked out from among these, and transferred to a small bag, which the man holding the basket had tied round his waist. In Gay's *Historia Fisica de Chili* it is stated that this species of camarōn is to be met with "en los embocadores de las riveras, donde construyer grandes cavidades que cubre con tierra."

The period of our stay at Coquimbo having drawn to a close on the 8th of September, Dr. Campbell and I landed for a last ramble over the sandy ground not far from the sea, where we found several beautiful plants which had lately come into flower, including the handsome *Leucocoryne ixioides*, the elegant little *Trichopetalum stellatum*, the inner divisions of the white perianth of which are delicately fringed, so as to resemble three small white feathers, and a beautiful species of *Calandrinia*, with a mauve-purple flower, drooping when in bud, but erect in full bloom. The plains were in some places so thickly covered with the blue convolvulus-like flowers of a Nolanaceous plant, as to appear like sheets of water. We also found specimens of a curious milky-juiced creeper of the Asclepias order, the *Oxypetalum Hookeri*. On the afternoon of the same day we weighed, and proceeded southwards on our way to Valparaiso, halting for a few minutes in Herradura Bay, where I got a couple of hauls in the dredge, and procured thereby three Gasteropods which I had not met with previously, the *Triton scaber*, *Chrysodomus alternatus*, and *Chlorostoma bicarinatum*.

We reached Valparaiso on the 7th, on a damp, misty forenoon, and during the four following days heavy rain fell with but little intermission—a sufficiently rare phenomenon in these parts, and attributed by the inhabitants to the agency of the recent earthquakes.

The 18th, or "diez-y-ocho," was a national holiday, being the anniversary of the independence of the republic of Chili. Invitations having been issued to the officers of the various ships lying in the bay to be present at the celebration of Grand Mass in the church of San Augustin, a party of us landed in the morning, and proceeded to the Intendencia, where we were ushered into a large room in which the Inten-

dente, a variety of consuls, and a number of Chilian, American, and English officers, were assembled in full uniform. In a short time a stout old padre in a white vestment made his appearance, which was the signal for a general rising, the company forming in procession, and marching two and two, preceded by him, through the streets, which were gaily decorated with flags, to the church in the Plaza de la Victoria. Passing into the square, which was crowded with gazers, and entering the church (the body of which was filled as full as it could hold with female worshippers attired in black, kneeling on their praying carpets, and the aisles with a miscellaneous assemblage of onlookers), we took possession of a number of chairs reserved for us, and ranged into two long rows on either side of the building. On a raised platform in front of the altar a number of priests in white were seated, three of whom were possessed of upper garments glittering with gold and silver thread. The altar was blazing with tinsel and numerous candelabra, and though it was broad day the edifice as a whole was illuminated with gas, and decked out with festoons of artificial flowers, and the flags of the nation. The musicians were established in a small gallery over the principal entrance of the building, and as the services of the principal opera-singers had been secured, the music that followed was exceedingly fine. The service soon commenced, and lasted a long time; but as I was quite unable to comprehend the greater part of the pantomimic performances of the ecclesiastics, I will not attempt to describe them, but may merely observe that a vast amount of rising up and sitting down was required on the part of the onlookers, and that, at one juncture, a priest preceded by an individual bearing a little silver wand marched from the altar to the other end of the church, where the Intendente was seated, and pre-

sented to him a large volume (which I presume to have been the Bible) and the wafer to kiss. After a time, we had a long sermon from a very intelligent-looking priest attired in a simple black gown. He spoke very distinctly, so that, even with our limited acquaintance with Spanish, we were able to make out the general topics of his discourse, which was adapted to the occasion, and delivered with a very considerable amount of eloquence, the leading subject appearing to be the progress of the nation under the guiding hand of Providence. The sermon concluded, a very fine musical performance ensued, after which we left the church, and, accompanied by a brass band and a rabble, marched back to the Intendencia. On our arrival, we were conducted up a stair, and ushered into a couple of drawing-rooms communicating with one another, where a short time was occupied in conversation, after which we adjourned to a large room where a good luncheon was set out. After a considerable amount of execution had been done in the way of eating and drinking, the Intendente rose and proposed the first toast, which was of course the President of the Republic, and was drunk with great enthusiasm, the Chilian "Vivas" being, however, rather drowned by the English and Yankee vigorous "Hip, hip, hip, hurrahs." A succession of other toasts then followed, and were still going on when our party took their departure between four and five P.M.

In the following afternoon several of us walked to the Playa-ancha, a wide flat space of ground on the high land to the west of the town, to witness a review of a part of the Chilian army. A vast concourse of spectators were assembled, and numbers of booths, where eating, drinking, dancing, and playing games of chance, were being carried on with great vigour, were erected in various places. A good many people were also running races in a most reckless

manner on horseback, their main object being to endeavour to ride one another down. A strong breeze was blowing, causing a vast amount of dust, which partially concealed the movements of the soldiers, who presented rather a mean appearance, arising from the smallness of their stature.

The heavy rains which had recently fallen had clothed the arid hills of Valparaiso with verdure, the *Calceolarias* forming splendid golden masses on many of the slopes, and a multitude of beautiful flowers coming into bloom. Thus, in the course of a single day spent in rambling about among the quebradas behind the town, I obtained three species of *Calceolaria;* three of *Loasa,* or Chilian nettle, with white, yellow, and orange blossoms ; two handsome Orchids of the genus *Chloræa;* the *Trichopetalum stellatum;* a beautiful Liliaceous plant, the *Pasithea cærulea,* with grasslike leaves, and a flower-stem often exceeding two feet in height, bearing a loose panicle of exquisite blue flowers ; *Leucocoryne ixioides,* with flowers varying from purple to bright blue ; a large orange-flowered *Geum;* an *Œnothera,* with large white flowers, growing in marshy places ; the *Alonsoa incisæfolia,* denominated, on account of its bright scarlet corollas, "Flor de Soldado ;" several Vetches ; a purple *Oxalis;* several species of Valerian ; *Mimulus parviflorus ; Gunnera scabra;* an *Acæna;* a *Polygala,* with blue flowers ; a blue *Myosotis;* two species of *Tupa;* several species of *Sisyrinchium;* a *Verbena, Tropœolum tricolor,* etc. etc. A few weeks later many other species came into bloom, among which I may mention a climbing Composite, with its leaves terminated by tendrils, the *Mutisia latifolia;* the *Salpiglossis sinuata;* several yellow-flowered species of *Oxalis,* and the lovely *Calydorea speciosa,* whose deep blue flowers, with yellow hearts, abounded on the sun-baked slopes of many of the hills.

On the 30th Dr. Campbell and I started by the ten A.M. train for Santiago, the Chilian capital, about a hundred miles inland, and somewhat to the south of Valparaiso. The first part of the line, *i.e.* as far as the station of Llaillai, though not new to us, was yet greatly improved in appearance since the time of our journey to Santa Rosa, the pastures being beautifully green, and a great variety of flowers being in bloom on the plains and hill-sides, and the railway banks covered with *Calceolarias*, the *Tropæolum tricolor*, and many other species. At the Quillota station, in addition to baskets of lucumas, cherimoyers, and oranges, "pejo reys" (*Atherinichthys microlepidotus*), "camarōns" (*Palæmon cæmentarius*), and small cheeses, were offered for sale; while beggars in troops planted themselves before the windows of the carriages, and droned out petitions for aid. Soon after passing Llaillai, the line lies for a time through bold hilly country, pursuing its course through several remarkable cuttings, and over some ingeniously constructed bridges—one of which, of considerable length, exhibits a striking lateral curve. We reached Santiago between four and five o'clock, and drove in a "coche" to the Hotel Oddo in the Calle Alumeda, passing through part of an avenue of Lombardy poplars, which extends throughout nearly the entire breadth of the town, and is termed the "Alumeda." Arrived at the hotel, we were established in one of a series of rooms ranged around a courtyard, and in about half-an-hour the table-d'hôte was ready; after which we walked out to view the streets, which did not appear to much advantage, owing to their being very imperfectly lighted, as there was supposed to be moonlight, although, owing to the cloudy state of the atmosphere, we obtained little or no benefit from the luminary. We entered a large church where vespers were going on, but as there was an exceedingly

"dim religious light," we could see very little, and so did not remain long, but passed the rest of the evening pacing up and down a fine arcade, which, being brilliantly lighted, and abounding in handsome shops, is a favourite resort for the beauty and fashion of Santiago.

Next day, October 1st, after breakfast, we walked to the little rocky hill of Santa Lucia, ascending it in an orthodox manner to obtain the view of the city, for which it is justly celebrated. It was a clear, sunny morning, so that the prospect more than came up to our expectations: the combined effect produced by the city, with its countless church towers and spires, extending for several miles over a flat green plain, and the surrounding mountains, some of which exhibited beautiful shades of purple, while others were white with snow, being remarkably fine. The regularity of the style in which the streets are laid out, so as to cross each other at right angles, and the manner in which the houses, roofed with reddish-brown tiles, are built so as to form hollow squares enclosing courts and gardens, with oranges and a variety of other trees and shrubs planted in the centre, conduced to form a very striking scene. After spending some time on the summit of the hill, and inspecting an old fort on one side, built by the Spaniards to repress the incursions of the Indians, we took a long walk through the streets, visiting many of the churches, some of the pictures and images in which were among the most revolting I have ever seen, as well as the site of the church burnt down in 1863, and a private house, built at an enormous expense, in imitation of the Alhambra; and then returned to our hotel to luncheon, afterwards proceeding to the Museum to call on Dr. Philippi, the distinguished director of it. We were much at a loss where to find him when we reached the shabby building which we

were informed was the Museum, but after a time were directed to his colleague Mr. Landbeck, who informed us that Dr. Philippi was not then at the Museum, and courteously offered to send a person with us to show us the way to his house. We thankfully accepted this proposal, setting forth preceded by our guide, and after walking for a considerable distance, were fortunate enough to encounter the object of our search, to whom we accordingly introduced ourselves.

Dr. Philippi was kind enough to accompany us to the Museum, where we spent a couple of hours in his company in the examination of specimens of Chilian plants and animals, receiving a great deal of information from him regarding the fauna and flora of Chili, of both which the Museum possesses, thanks to his zeal, an admirable representation, causing us to regret all the more the poor accommodation allotted to it by the Chilian government. The ornithological and malacological collections, as well as the herbarium, struck me as particularly fine, and remarkably well arranged for purposes of study.

After leaving the Museum we called on a Chilian gentleman to whom I had been given an introduction by one of the English merchants in Valparaiso, and in the evening dined with him at a large club, of which he was the secretary. As he possessed an excellent knowledge of the English language, we gained much information from him regarding Santiago and its inhabitants. Although a Roman Catholic, he appeared to entertain the very lowest opinion of the morale of the priesthood, describing their general character in very forcible terms, and giving us plainly to understand that they possessed but little religious influence, save with the female portion of the community. On the forenoon of next day, which was very fine, though the distant prospect

was not so clear as on the 1st, we took a long circuit through the streets, crossing the river Maypu, which flows through part of the town, and walking out into the suburbs. We entered a large cemetery, and were strolling carelessly about in it when we accidentally lighted upon the plot of ground where the remains of the women, burnt in the conflagration of the church in 1863, are interred. The ground is railed in, and in the centre of the space a large metal cross is erected, while fixed to the railing in front are two marble tablets, bearing an inscription recording the tragical event, and terminating with the words, "Restos de sus Victimas, 2000 mas o menos." Although the dastardly conduct of the priests on that occasion excited the utmost indignation at the time, the lower classes appear to be still thoroughly priest-ridden, and Santiago gives one the impression of a city where Roman Catholicism, in its worst form, is rampant.

In the afternoon we visited, under the guidance of the Chilian gentleman above mentioned, a most interesting relic of the Spanish conquest, namely, the original house of the celebrated Pedro Valdivia, a very miserable-looking little dwelling, to which we gained access through the politeness of an ecclesiastic. After that we walked to the so-called Botanical Gardens, which appeared to partake of the nature of a wilderness, returning to our hotel in time for the table-d'hôte. Next morning our brief sojourn was brought to a close, and we left Santiago at ten A.M., reaching Valparaiso between four and five in the afternoon.

CHAPTER XIII.

LEAVE VALPARAISO—ARRIVE AT LOTA—LONG RIDE—LUCO BAY—ROBLE — BUDDLEA — TRACHYPTERUS — TORPEDOS — PLANTS — MARINE ANIMALS — QUELS — PIURE — REACH SAN CARLOS DE ANCUD—CORMORANTS AND PETRELS—EDWARDSIA MICROPHYLLA — QUEHUY — CALCEOLARIA — LUZURIAGA — RHINODERMA — INDIAN INHABITANTS OF QUEHUY—GUAYTECAS ISLANDS—PORT MELINKA — CAVE WITH BONES OF CHONOS INDIANS — PORT LAGUNA—PLANTS—MYOPOTAMUS—DARWIN CHANNEL—ENTER THE MESSIER CHANNEL — LEBETANTHUS — GRAY HARBOUR — CHILINA—PORT GRAPPLER—FISH—CURIOUS PLANT—CRANIUM OF DEER—PUERTO BUENO—AMPHIBIA—OXALIS MAGELLANICA—FORTUNE BAY—INDIANS—FISH—MEET A WHALING SCHOONER—OTTER ISLANDS — WILLIWAWS — SHOLL BAY — CROSS THE STRAIT TO THE ISLAND OF DESOLATION — TUESDAY BAY — CHRISTMAS DAY—PORT CHURRUCA—PORT ANGOSTO—SWALLOW BAY—MEET OUR PROVISION BRIG.

THE month of October passed without the occurrence of any events meriting a special notice in this place, and early on the evening of the 3d of November we bid farewell to the Bay of Valparaiso, and began our southerly voyage. The 4th was a fine sunny day, but the wind was unfavourable, obliging us to keep under steam. On the evening of the 5th we reached Lota, and there anchored, and the following morning I landed with Captain Mayne, and had a very pleasant long ride with him into the country beyond the small town or village of Coronel, some miles to the northward of Lota. The day was all that could be desired, and the country was looking most beautiful; rich in trees and shrubs, and with a

profusion of flowers in bloom, some of which, such as the large white-flowered *Œnothera mutica*, the exquisite blue *Pasithea cœrulea*, and the *Tropœolum tricolor*, I had already observed in the north, while others were now seen for the first time. Among the latter were the Chilian strawberry (*Fragaria Chilensis*), and a handsome twining Amaryllid, the *Bomarea Salsilla*, with umbels of purple flowers. *Lapageria rosea* was completely out of flower on this occasion, though I recognised many specimens of its young shoots. When we started on our ride we had some idea of going as far as Concepcion; but as, after riding sixteen miles, we were informed that the city was yet twenty miles distant, it appeared that it would be impracticable for us to reach it without being much later in getting back to the ship than seemed advisable, and we therefore relinquished the attempt, and halted for a time at a pretty little hacienda, the steward of which had passed some years in San Francisco, and spoke English tolerably well. He very hospitably invited us to his house, where he entertained us with some excellent home-made bread and butter, and "chicha manzana," namely—chicha made from green apples, an extremely acid composition. He possessed a variety of dogs, among which was a black cross between a bull-dog and mastiff, which, despite its ferocious appearance, was a most amiable creature; and a fine set of beehives, some of the inhabitants of which were swarming. He informed us that pumas were common in the neighbourhood, and some ludicrously ill-stuffed specimens of these quadrupeds, somewhat resembling four-legged bolsters, were suspended from the rafters of a shed.

Next morning a party of us landed, and after a ramble along the beach to the south of Lota in search of marine animals, in the course of which we encountered a consider-

able variety of Mollusca and Crustacea, climbed up to the high ground, where I found several plants that were new to me, including a beautiful species of *Tigridia*, with pale bluish-purple flowers, beautifully variegated at the base of the outer segments of the perianth with dark purple dots, which occurred among wheat, and an *Anagallis*, the *A. alternifolia*, with pale pinkish-white blossoms. Many specimens of a pretty little green and blue lizard, the *Leiolæmus pictus*, not previously seen, were observed running about, and one was captured and added to my collection. We returned to the ship between one and two P.M., and immediately afterwards we weighed and left Lota, but finding the wind very strong against us, only moved on as far as Luco Bay, one of the subdivisions of the bay of Arauco, and there anchored. The 8th was a lovely day, but the wind still so strong outside that we remained at anchor. As usual, the dredge was made use of, and in the morning we obtained, by means of it, specimens of an Isopodous crustacean, of the genus *Serolis*, the *S. Gaudichaudii*. The aspect of the country, as seen from our anchorage, was remarkably attractive—steep grassy banks, beautifully diversified with trees and shrubs, rising above smooth yellow sandy beaches and steep sandstone cliffs; and the greater number of us in consequence landed in the afternoon for a walk, in the course of which I observed many fine examples of the Roblè (*Fagus obliqua*), forming beautiful spreading trees, which afforded a pleasant shade, and I also saw for the first time the *Buddlea globosa*, whose rounded heads of orange-yellow flowers diffused a heavy honey-like perfume. A seining-party, which had been despatched early in the afternoon, returned in the evening with a large supply of small fish, including some fine *Pleuronectidæ*, resembling plaice in general appearance, a

large number of the curious *Callorhynchus australis*, and several Torpedos (a species of *Discopyge*, I believe), which inflicted severe electric shocks on those who handled them. A single specimen of a very remarkable fish of the family *Trachypteridæ* was likewise taken—viz. the *Trachypterus altivelis*, previously known from a single specimen in the Vienna Museum, which was captured at Valparaiso. The body of this fish is so much compressed from side to side as to resemble a knife-blade in thinness, and is covered with minute silvery scales, and the dorsal and caudal fins, like those of the other species of the genus, are of very peculiar form.

The 9th was also a beautiful day, but it was still blowing hard outside, and accordingly, after a fruitless attempt to make headway, we returned to the bay to remain for the day, and a large party, of which I formed one, landed early, and passed some very pleasant hours on shore. On the sandy beach, where a stream ran into the sea, I found a very rich deposit of magnetic iron ore, and, above high-water mark, a blue-flowered species of *Sorema* and a *Euphorbia* were growing luxuriantly. The hills also yielded me a considerable variety of plants. The *Tigridia* obtained at Lota was exceedingly common in many places, and communicated a most beautiful appearance to the banks. Its petals were, however, unfortunately so exceedingly fugacious, that I did not succeed in preserving any of the flowers. An *Embothrium* (*E. lanceolatum*) formed a tall shrub, loaded with brilliant scarlet flowers. It is a handsomer species than the *E. coccineum*, which I did not meet with to the north of Chiloe. Among the other plants met with were a tall Lauraceous shrub, with viscid leaves; several *Compositæ* that were new to me; a small purple *Œnothera*, *Pasithea cœrulea*, the Chilian

strawberry, an orange-flowered *Linum*, two species of *Chlorœa*, a *Libertia* (*L. ixioides?*), etc. I stopped at noon at a rancho, where I saw a girl engaged in the preparation of cheese, squeezing the consolidated curd through her hands, which were not over clean, into a wooden mould. In the course of the afternoon I descended to the beach to explore the rocks, some of which were very bold and striking, formed of sandstone of various degrees of hardness, and remarkably furrowed and hollowed out by the action of the waves. On the sides of a deep cleft a number of fish of the genus *Gobiesox* were clinging to the rocks, between four and five feet above the level of the water, by means of a strong subthoracic sucker; but I failed in obtaining specimens of them, as they all let go their hold and dropped into the water on my approach. Among the marine animals observed were—*Fissurellæ*, *Concholepades*, and *Patellæ*, many large specimens of *Amyxa niger*, and some bright purple encrusting sponges. Numerous gulls and terns were flying about, and a large flock of pelicans lighted on a reef of rocks at no great distance from me. Some of the officers had taken their guns on shore with them, and some pigeons, as well as a solitary partridge (*Nothura*), were shot, and several spur-winged plovers (*Vanellus Cayanus*) and woodpeckers (*Colaptes pitius*) seen.

The 10th was also fine, but as the wind still continued adverse, Captain Mayne resolved on remaining for another day where we were. Before breakfast, an "Englishman," who, we had been informed by some Chilians, was living on the coast of the bay, a weather-beaten, rather rough-looking large-made man, of between fifty and sixty, came on board, and informed us that there were some remarkable ancient tumuli on a piece of land belonging to him, offering to show them to

us if we thought them worthy of examination. I therefore applied to Captain Mayne for a few of the men to carry on excavations, and shortly after landed with our informant. In the course of conversation with him on our way on shore, I accidentally learned that he was a Scotchman, from Edinburgh, and on my telling him that I hailed from the same quarter, he gave me a sketch of his history, which was not a little curious. He had been educated at the High School of Edinburgh, but having a passion for a roving life, had run away from home, joined an outward-bound ship, and been wrecked on the coast where he now lived, in 1839, never having, since that time, moved many miles from his house and the small piece of land which he possessed. He had married a Chilian wife, and had a family, about whose education he was a great deal taken up. He had evidently a great zeal for reading, and asked me many questions about Carlyle's and Hugh Miller's works, and as to what was thought of Mr. Darwin's *Origin of Species*. He was also very anxious to hear news about Edinburgh, and inquired whether the National Monument on the Calton Hill was yet completed. On landing we ascended one of the steep hills to the nearest tumulus, a grass-grown mound resembling a barrow, and about four feet in height, and leaving the men to excavate this, we walked on for a couple of miles to look at some other tumuli. As we went we had much talk, alike of the old country and Chili, and I received a good deal of information from him about the latter. He dwelt much on the rapacity and tyranny of the priests, mentioning many instances of the manner in which they fleeced the poorer classes. We at length ascended to a height of, as nearly as I could calculate, a little under two thousand feet, from whence we had a magnificent view of the surrounding country and the bay of Arauco. Here were

some more of these tumuli, which my guide stated were not the work of the present Araucanian Indians, who appeared to be entirely ignorant of their origin, and termed them quèls. He also mentioned that some examples which he had seen were between thirty and forty feet in height. He had had several interviews with the Araucanians, who, on one occasion, had despoiled him of some of his possessions, and mentioned that, like many other Indian nations, they bury garments and provisions along with their deceased friends, in order that they may be suitably provided in their journey to the "land of the hereafter." On our return to the first tumulus we found that the diggers had met with no results, and as our time was but limited, I did not deem it expedient to prosecute the search farther. In the course of a stroll along the rocks later in the day, I found a curious social Tunicate, the "piure" of the Chilotes, occurring in great abundance, along with extensive colonies of a Sabelloid Annelid. The "piure," which is also common in Chiloe, is regarded as a considerable delicacy. It appears to have been first described by Molina, who remarks that it scarcely deserves the name of a living animal, and that it is as remarkable for its figure as for the manner in which it is lodged, observing that the animals are enclosed in a firm envelope of various forms, and that one of these cases often contains eight or ten distinct individuals, separated from each other by partitions formed of a strong membranous substance.

My other zoological captures on this occasion consisted of a fine swimming-crab (*Platyonychus purpureus*), many individuals of which were taken by a seining-party, a small slender snake, the *Dromicus Temminckii*, and a few Coleoptera, including two female specimens of a large Longicorn species (the *Acanthinodera Cumingii*), which emitted a very unpleasant odour on being handled.

The wind gradually fell in the evening, and at four A.M. on the 17th we got under way, and stood out along the coast, proceeding southwards very quietly. The 12th was fine, but the wind unfortunately considerably against us, and a pretty heavy swell on, which elicited the usual amount of heavy rolling, for which our vessel appeared to have a remarkable aptitude. The 13th was of much the same nature, and on the 14th, before breakfast, a most dismal morning of heavy drizzling rain, which caused us to realise that we were entering the region of almost perpetual wet, we reached the bay of San Carlos de Ancud, and anchored at our old station off Punta Arenas. The rain, however, gradually cleared off, and by noon the sun was shining brightly. The land appeared rather less green than it did at the time of our first visit, owing in great measure to the young foliage of many of the shrubs, especially those belonging to the order *Myrtaceæ*, possessing a reddish-brown hue. As usual, several of us landed in the afternoon, and remained on shore till between five and six P.M. The *Fuchsias* and *Escallonias* were beginning to make a show, and the tall Malvaceous shrub observed in the month of May was covered with its large white and pale purple flowers. Both the white and purple varieties of our native foxglove were also flowering luxuriantly, and the stems of many of the trees were covered with the scarlet flowers of the *Sarmienta repens*, and the beautiful white blossoms of *Callixene polyphylla*, and of a species of *Luzuriaga*. On the cliffs near the sea I obtained a splendid *Calceolaria*, which I had not before observed, as well as a species of *Libertia*, with large handsome white flowers; and at the edge of the woods, *Buddlea globosa*, *Berberis Darwinii*, *Codonorchis Lessonii*, and many other plants, all in flower. I also found a single specimen of a frog of the genus *Cystignathus* (*C. tæniatus*), described

by Girard from specimens obtained in the vicinity of Santiago, as well as a handsome golden-green Lamellicorn beetle, the *Brachysternus viridis;* and among the marine animals procured on this occasion was an exquisite little Nudibranchiate mollusc, marked on the mantle with elevated orange spots.

The 15th was a beautiful day, the horizon gradually clearing, so as to afford a fine view of Osorno and Quellaype, and the peaks of the Cordillera, all dazzlingly white with snow. I landed in the afternoon with two companions, and walked for some miles along the beach, noticing large flocks of the *Phalacrocorax Gaimardii*, and of a diving petrel, which, flying along a few feet above the surface of the water, would suddenly drop into it like so many stones, emerging again at a considerable distance. I found for the first time, on this occasion, specimens of the yellow flowers of a low Leguminous tree, the curious four-winged pods of which had attracted my attention on our former visits. This was the *Edwardsia microphylla*, one of the *Sophoreæ*, characterised by having the filaments of the stamens not united into a bundle like the majority of the order to which it belongs. It is principally to be met with in South Chili, but also, I believe, occurs in the island of Juan Fernandez. On the 16th, which was also fine, I was one of a party who spent the day cruising about the head of the bay in quest of sport. We saw an enormous flock of the small curlew observed on former occasions, as well as several godwits, turnstones, oyster-catchers, and teal, but did not discover anything new. On the afternoon of the following day Dr. Campbell and I landed, and procured specimens of some small birds, including a pretty little slate-coloured and white finch, the *Diuca grisea*, which was very common, flying in small flocks over the cleared patches of ground, and a woodpecker (*Colaptes pitius*), which was feeding on the

ground on ants' larvæ. On the 19th I landed on the opposite side of the bay from our anchorage, and spent some hours botanising, finding in the woods a small species of *Libertia* which was new to me. In open spaces there was a splendid display of white and purple foxgloves, and I found the *Tricuspidaria* or *Crinodendron* observed in the preceding April in abundance, its low trees being red with a multitude of the fine drooping crimson flowers. I also obtained flowering specimens of the Proteaceous *Lomatia ferruginea*, which I have previously mentioned extends far down the west coast of Patagonia. Another tree belonging to the same order, which occurred rather plentifully, was the *Quadria heterophylla*, with rather large pinnate evergreen leaves, and a small edible fruit of a nutty flavour, on account of which it is termed "avellano" by the Chilian country people.

On the afternoon of the 20th we left the bay of Ancud, and passed into the Chacao Narrows, anchoring for the night in Lacao Bay. Next morning we got under way, and proceeded southwards to the island of Quehuy, situated about half-way down the east coast of Chiloe. The day was at first bright and clear, and the view of the dark frowning headlands and snowy peaks beyond was remarkably fine. We anchored off the island soon after noon, as we had been informed that two Englishmen lived there who were well acquainted with the Chonos Archipelago, and Captain Mayne was anxious, if possible, to secure the services of one or other of them to pilot us through the intricacies of that imperfectly known region, which we were desirous of seeing something of. Heavy rain set in by the time we came to our anchor, and continued throughout the remainder of the day, but this did not prevent a considerable number of us from landing, and spending the afternoon on shore. I at first pursued my way

for some distance along the beach at the foot of some soft sandstone cliffs, varying from thirty to sixty feet in height, and abounding in magnificent specimens of *Gunnera Chilensis*, and the fine *Calceolaria* obtained at Ancud. Several plants of the latter attained a height of upwards of three feet, and were profusely covered with the large yellow blossoms. Near the edge of the cliffs were some fine low trees of *Embothrium coccineum*, glowing with the scarlet flowers, about which numbers of humming-birds were flying. On leaving the beach I followed for some distance a narrow path which led into a thick wood, where I found the *Luzuriaga* obtained at Ancud in wonderful profusion, clothing the stems of the trees, its masses of delicate fragrant white flowers and orange berries producing a most beautiful effect. At the edge of the woods I met with two species of *Solanum* not previously obtained, one forming a sort of climber, and the other a stout shrub. Chimangos and carranchas were among the few birds observed, a fine specimen of one of the latter being shot by one of the officers, and I made a single new zoological capture, in the shape of a curious little Batrachian, the *Rhinoderma Darwinii*, with its skin blotched with black and white, and possessing a projecting dermal appendage on its muzzle.

The morning of the following day was showery. We were besieged at an early hour by nearly the entire population of the island, who came off with the view of selling potatoes, eggs, fowls, and small sheep. Many of them possessed thoroughly Indian features, and I was informed that there were a considerable number of them who were pure Indians, speaking the Huilliche language. In the afternoon Dr. Campbell and I landed, and took a long walk, in the course of which we met a man named Burns, who afterwards acted as our pilot through the Chonos Archipelago, as well as many of

the islanders, to whom we appeared to be objects of much curiosity. They were very anxious to be polite to us, one man on horseback coming a long distance out of his way to offer to carry us across a stream in whose neighbourhood we were. As a rule, we found the Chilians, both of the upper and lower orders, exceedingly kind and hospitable. Often, on passing the poorest hovels, their owners would come out to ask us to come in and rest, offering us "chicha" or "aguardiente" by way of refreshment. Upon the sandy beach of this island I found fragments of the great hands of a burrowing Crustacean, the *Callianassa uncinata*, and I was informed that it was very commonly to be met with burrowing in the sand.

On the 23d I was roused at four A.M. by the officer on watch to witness the sunrise, which was magnificent in the extreme—the range of the Cordillera, with its numerous sharp peaks, being of a deep purple tint, and a great mass of cloud, mottled with crimson, and purple, and gold, projected against a pale green sky. The day that followed was splendid, and as we steamed southwards, the mountain scenery on the mainland was very fine, the Minchinmadiva, Corcovado, and Melimoya mountains being specially noteworthy on account of their sharp peaks covered with snow. Between four and five P.M. we reached Port Melinka, on the eastern side of the largest island of the Guaytecas group, and there anchored, immediately after which four of us left the ship in the dingy to explore a neighbouring islet, where we had been informed there was a cave containing bones of the extinct Chonos Indians. After a rather long pull, we reached this island, and proceeded along the coast, keeping a sharp look-out for any indications of the presence of a cave, and after a time halted at a low sandy spit, off which the wreck of an old schooner was lying. Here we landed for a few minutes, and I made a

small collection of plants, the principal of which were the *Chusquea* so abundant at Ancud, several *Myrtaceæ*, the *Edwardsia microphylla*, *Citharexylon cyanocarpum*, *Sarmienta repens*, a purple *Labiate*, an *Uncinia*, the large white *Libertia* common at Chiloe, and a handsome purple *Lathyrus*, new to me. We saw a number of kelp-geese (*Chloephaga antarctica*), as also some steamer-ducks, and a few parroquets. On the way back, as we pulled along the coast of the island, we maintained an anxious scrutiny for the cave, and at length stopped at a spot where there seemed to be an opening in the rocks. On landing, I was much pleased to find that we had hit upon the right place; and on entering the small cave, which must have measured about four yards long by nearly four feet and a half in height, and the same in breadth, we were rewarded by the discovery of four crania,* and a number of other bones, which we carried off in triumph to the vessel.

On the 24th we got under way at four A.M., but after proceeding about fifteen miles southwards, in the course of which we passed over various islands as laid down in the chart, rain and mist set in so thick that we anchored at Port Balena, in a group of islands not honoured with any special name. Here I obtained two small species of Crustacea, a *Betæus* and *Palæmon* or *Hippolyte*, in the dredge. We remained at anchor till shortly after noon, when the rain and mist cleared off, and we got under way, passing southwards between the mainland and the myriads of islands of which the Chonos Archipelago is composed, and halting for the night at or in the immediate neighbourhood of Port Nevada, which, like the two preceding anchorages, was not laid down in the Government chart, but which is situated somewhere on the western side of the northernmost large mass of the Archipelago, and consequently to the north of the Ninualac Channel.

* Now in the Museum of the Royal College of Surgeons, London.

Next morning, 25th, we left our anchorage, and proceeded southwards to Port Laguna, considerably to the north of the Darwin Channel, reaching it at about eleven A.M., and remaining there for the rest of the day. Several of the officers, with myself, landed at one P.M., and spent the afternoon on shore, where I found that the vegetation exhibited a very gradual transition from that of Chiloe to that of the Channels. The following were the principal plants observed:—*Podocarpus nubigenus*, also seen at Port Melinka; *Metrosideros stipularis*; a tree first observed in the western part of the Strait, and which appears to be a species of *Panax*; *Embothrium coccineum*, in flower; *Lomatia ferruginea*, in flower; *Escallonia macrantha*, ditto; *Drimys Winteri*; *Pernettya mucronata*; an arbutus-like shrub, first observed at Chiloe; *Desfontainea spinosa*; *Berberis Darwinii* and *B. dulcis*; *Campsidium Chiliense*; the *Columnea* previously obtained at Port Otway; *Philesia buxifolia*; *Chusquea Quila*; the *Libertia* obtained at Ancud and Port Melinka (probably *L. elegans*, Pœppig); *Callixene polyphylla*, in fine flower; several shrubs not yet identified; an *Uncinia*; and the usual Hymenophyllous ferns, including *H. cruentum, caudiculatum, tortuosum, pectinatum.* This was the southernmost locality in which I met with *Escallonia macrantha, Berberis Darwinii*, and *Chusquea Quila*, and the last occurred very sparingly. *Sarmienta repens*, I may here remark, was not observed south of Port Melinka.

We saw an otter, and picked up some skulls of the Coypou (*Myopotamus*), and several specimens of *Chloephaga poliocephala* were shot, as well as a teal and a black oyster-catcher. On the beach I found live specimens of *Amyxa niger*, a *Monoceros*, and two species of *Patella*; and a single specimen of a crab, *Trichodactylus granarius*, previously found at Chiloe and in the Messier Channel, was captured by one of

the officers in a small lake of brackish water from which the port derives its name.

On the 26th we got under way at an early hour, and having parted with our pilot, who joined a wooding party from Quehuy, we passed into the Darwin Channel, the scenery of which is of a very bold, striking nature, and passed into open water about noon. There was a very heavy sea on when we cleared the land, but fortunately a strong wind in our favour, so that, though the style of our progression was far from agreeable, we made good way through the night, rounding Cape Tres Montes next morning, and then crossing the Gulf of Peñas to the Messier Channel, which we entered early in the afternoon, finding heavy rain descending as usual. We anchored in Connor Cove between six and seven P.M., and it rained hard all night and throughout the greater part of next day, with occasional furious squalls, which made us feel thankful that we were lying in a comfortable berth, instead of being out at sea. As the rain cleared off in the evening, a few of us pulled up the stream opening into the head of the cove, and landed in various spots, finding everything drenched with moisture. I noticed some fine flowering specimens of the *Campsidium*, but they occurred too high up on the trees to be attainable; and I found for the first time specimens in bloom of a pretty heath-like plant common in the Straits and Channels, and ascending the stems of the trees to a height of ten feet or more. This was the *Lebetanthus Americanus*, the sole South American representative, I believe, of the order Epacridaceæ. The flowers are small, of a pretty pink colour, and deliciously fragrant.

On the morning of the 29th we got under way, and moved onwards to a new port, Gray Harbour, immediately to the south of Halt Bay. Many heavy showers fell throughout

the day, with bright sunshiny intervals between them, when the wooded mountains, on the summits of many of which snow had fallen the night before, appeared very beautiful. We reached the harbour between one and two P.M., and there anchored, soon after which some of the officers made an excursion in one of the boats to a large lake-like expanse of water at the head, with a river flowing into its upper end. On their return they brought me specimens of a fresh-water shell of the genus *Chilina*, which was new to me. The following morning was showery and very cold, the snow-crowned hills in our vicinity presenting a decidedly wintry aspect; and, after an interval of between five and six months, we resumed our fire in the wardroom. Three of the officers, with myself, left the ship soon after breakfast, and pulled up the river for some distance. In a small bay, communicating with the lake-like expanse already referred to, we found many specimens of the *Chilina*, procured the day before, associated with live barnacles in brackish water. Many of the shells had their apices much eroded. On shore I found a spider of considerable size inhabiting a burrow in the soft decaying moss, wide enough to admit of one's thumb. It had a large bag of eggs attached to the abdomen; and on taking hold of it with a pair of forceps to place it in a phial of spirit, it ejected a jet of fluid to a distance of several inches from the extremity of the abdomen. I obtained fine flowering specimens of *Escallonia serrata* and *Pinguicula antarctica*, as well as of a white-flowered Valerian, new to me; and I found *Lepidothamnus Fonki* both in flower and fruit.

On the 1st of December we left Gray Harbour, and passed southwards through the English Narrows and Indian Reach to Port Grappler on the mainland, opposite the north-east corner of Saumarez Island. We reached our destination, a

remarkably fine spacious harbour, between six and seven P.M., and shortly after we anchored one of the men caught a fish about nine inches long, which was, as usual, handed over to me. This was the *Chænichthys esox*, one of the *Trachinidæ* described some years ago by Dr. Günther from an old stuffed specimen in the British Museum, which had formed one of a collection of fish made by Captain King at Port Famine. When newly caught its sides were elegantly barred with narrow bands of grayish-black and violet-purple. Attached to the skin I found several specimens of a parasitic crustacean of the genus *Caligus*, which, being apparently the type of a new species, I have named *C. chænichthydis*.

On the 2d the surveying officers were busily occupied in making a plan of the harbour, and several of those who were not engaged in this manner, including myself, left the ship early in the forenoon to explore the surrounding land. Up at the head of the harbour was a space of flat and tolerably open ground, overgrown with coarse grass, and here we observed some geese (*Chloephaga poliocephala*) feeding, several of which were shot from the boat. We then landed to capture the wounded, and spent some hours rambling about in search of game and specimens. I obtained some handsome lichens and mosses on the trees, but did not observe anything novel till I arrived at an open space of mossy ground, when I suddenly perceived the foliage of a plant with creeping stems, with which I was unacquainted, and to my delight recognised as a species for which I had been hunting for the last year—namely one, of which a specimen, not in flower, had been sent home by Captain King nearly forty years before, and deposited with his collection in the Kew Herbarium, and of which Dr. Hooker was anxious that I should, if possible, procure flowering examples, with a view to the determination of its true

affinities. At first I could perceive no flowers, but on going down on my hands and knees, and crawling over the ground in this fashion, I after a time found flower-buds, and then fully opened flowers, and last year's fruit. The plant is, I believe, regarded by Dr. Hooker as an aberrant member of the order *Saxifragaceæ*, forming, in his opinion, the type of a new genus, which I hope will be described fully ere long. A detailed account of it would be out of place in the present narrative, and I shall therefore content myself with stating that the corolla is formed of five white petals, that the ovary is trilocular with axial placentation, and that the fruit is a capsule opening by three valves. Later in the day we visited several Fuegian camping-places at different parts of the harbour. The low beehive-shaped skeleton wigwams were in general surrounded on three sides by *Fuchsia* bushes, which formed an excellent shelter from the wind, and heaps of dead shells (among which I found a single specimen of an old worn *Concholepas*) and an abundant crop of nettles were, as usual, to be seen in the vicinity. The sites of these wigwams could almost invariably be readily recognised at a distance by the bright green tint of the herbage, which contrasted remarkably with the more sombre hues of that around. At one of these encampments I picked up a portion of the cranium of a deer in a good state of preservation, and I also found numerous plants of an elegantly cut fern (an *Aspidium*), not met with by us before or since in any other locality. Two distinct forms of it occurred, differing so conspicuously in the cutting of the pinnæ, that had I not found them growing side by side, and connected by intermediate links, I should certainly have attributed them to distinct species. I also obtained very fine flowering specimens of *Lepidothamnus* on this occasion.

The 3d was a day of very heavy rain, and after devoting the forenoon to drawing the details of my new plant, I sallied forth with two companions in the dingy, and we pulled up to the head of the harbour, where some more geese were shot, after which we followed the winding course of a stream for a quarter of a mile, when the rapid shoaling of the bottom placed an arrest on our further progress.

On the 4th we left Port Grappler in the morning, and passed southwards through Wide Channel, examining the coast for harbours. About five P.M. we met a Chilian vessel, the "Arauco," on her way from Sandy Point to Valparaiso, and despatched letters by her; and three hours later we anchored in, or in the vicinity of, Tom Bay, near the northern extremity of the Concepcion Channel, on the east coast of the Madre Islands. Next morning we again moved southwards, looking out for harbours, and after spending some time in the examination of a cove in the Guia Narrows, we passed on to Puerto Bueno, anchoring there between eight and nine P.M. The morning of the 6th was rather fine, so that this very pretty harbour, which well deserves its name, appeared to full advantage. Close to the water's edge is a narrow strip of grass, and immediately behind this a high bank covered with a belt of trees consisting of evergreen beech, Winter's-bark, *Libocedrus*, etc., while beyond, as far as the eye can reach, extend bare hills, with occasional patches of stunted shrubs, and extensive tracts of boggy ground, covered with a thick low vegetation of *Lepidothamnus*, *Caltha appendiculata*, and *C. dioneæfolia*, *Astelia*, and *Gaimardia*. Some of the officers, who landed in the morning to take sights, brought me off several specimens of a pretty *Carabus* (*C. suturalis*), previously found at Sandy Point, a *Succinea*, and some earth-worms. As early in the afternoon

it was only raining slightly, Dr. Campbell and I landed, as usual encased in mackintoshes and sea-boots, and had a long ramble over the nearer and lower ranges of hills. The rain soon increased in vehemence, and lasted throughout the whole time we were on shore, but the comparatively open nature of the ground rendered walking not so fatiguing as usual, although water was squeezed out of the soil wherever we placed our feet. We came across a number of deep lakes of no great size, several of which were connected in a chain by means of a rapidly flowing stream. The principal plants observed were stunted specimens of *Metrosideros stipularis*, evergreen and antarctic beeches, *Embothrium coccineum*, and *Lomatia ferruginea*, together with a variety of the universally distributed bog-plants. A few geese, some black starlings (*Curœus aterrimus*), and many of the little creeper (*Oxyurus*), were seen, the last mentioned hopping about the stunted bushes in small flocks, and accompanying us from place to place. On the 7th heavy rain fell throughout the day, during which I remained on board, and the same was the case on the 8th, the afternoon of which I spent on shore. I was much interested on the latter day by observing some tadpoles in the pools of water on the boggy ground, showing that Amphibia extended as far south in this wet region (the climate and vegetation of which are almost identical with those of Fuegia) as lat. 51° S.; and two days later one of the men, a zealous collector of objects of natural history, brought me specimens of the little striped frog (*Nannophryne variegata*) discovered the previous season at Eden Harbour, as well as an example of the genus *Hylodes*, which Dr. Günther considers as identical with the *H. leptopus* (Bell), of which but a single specimen, in a very bad condition, previously existed in the British Museum, procured by Mr. Darwin at Valdivia, to the north of

lat. 40°. The species therefore possesses a geographical range of between six and seven hundred miles. I think it therefore far from improbable, judging from these facts, that some future naturalist may discover Batrachia to the south of the Strait of Magellan.

On the 9th heavy rain fell throughout the day, and snow descended thickly on the nearer hills, while towards the evening sleet fell heavily on deck. It was bitterly cold, and the landscape presented a most wintry appearance about nine P.M., when the weather cleared up for a short time, the snowy hills appearing very close to us, and the bare rock-faces looking most drearily black. And this, the reader will bear in mind, was mid-summer! On the 10th two of the officers, with myself, landed early in the afternoon, and walked to a neighbouring inlet, in the vicinity of which I obtained for the first time the pretty little white-flowered *Oxalis Magellanica*. From the summit of a hill upwards of a thousand feet in height I gained a fine view of the Channel, and watched a magnificent snow-cloud gradually sweep down it. Heavy rain fell throughout the next three days, but on the 14th there was a very considerable improvement in the weather, which we made use of to get under way and continue our southerly course, looking for harbours on the way, our researches being rewarded by the discovery of a fine new anchorage in the Sarmiento Channel, on the west coast of the largest of the Owen Islands, which subsequently received the name of Mayne Harbour, in honour of the head of the survey. Here we spent about an hour, and I landed for a walk, and procured fine specimens of *Lebetanthus Americanus* and other plants. This, as I have earlier observed, was the southernmost locality in which I observed the curious *Lepidothamnus*. In the evening we reached Columbine Cove,

on the east coast of Newton Island, and there remained for the night, weighing early next morning, and moving onwards. Leaving two of the boats to survey Victory Pass, between Hunter Island and Zach Peninsula, we proceeded to Fortune Bay, on the east coast of the Queen Adelaide Archipelago, and there anchored at ten A.M., perceiving, shortly before we came to a halt, several Fuegian canoes pulling towards Long Island, opposite the bay. Before long heavy rain set in, and lasted throughout the forenoon. In a short time we were joined by the Indians, who arrived in detachments in their canoes, the first that came alongside containing the party which we had encountered during the previous season in Sholl Bay, and who evidently recognised us as old acquaintances, nodding and smiling profusely. This canoe was followed by two others, and, in course of time, by a merchant-ship's boat, by what means acquired it is of course impossible to say. During the forenoon we had upwards of forty of these people on board—the entire number of those who came alongside, including men, women, and children, amounting to about sixty individuals. Some of these were hideously ugly, while not a few possessed very intelligent countenances, and nearly all appeared to have a great capacity for laughter. There were the usual demands for "Galleta" and "Tabaca," and they were most indiscriminate in their desires for our property—a man who had had his face soaped, to his great edification, making signs for my handkerchief to wipe it with; and a woman wishing to effect an exchange between her bone necklace and the watch-chain of one of the officers. Our caps were also much coveted, our watches excited great interest, and a small looking-glass was a source of wonder, evidently mingled on the part of some with a considerable amount of awe.

They bartered shell and bone necklaces, slings, bows, quivers of otter-skin, arrows, and spears, for knives and tobacco. The spear-handles were formed of tapering poles of *Libocedrus*, about eight feet long; and the heads, apparently fashioned out of the bones of Cetacea, were of two forms—one which, in so far as we could learn, is employed for harpooning porpoises, being attached by a leather thong to the spear-handle in such a manner that, when the porpoise is struck, it becomes detached, so as to leave the handle floating on the water; while the other, armed with a serrated edge, and permanently fixed into the handle, is used for the capture of otters and fish. Our visitors entertained us with what appeared to be national melodies, of a rather monotonous character, and as usual imitated everything we said with the utmost accuracy.

The rain cleared off at about two P.M., and two more of the boats were despatched on surveying work, shortly after which the Fuegians left us, considerably to our relief, and encamped on an open space on shore opposite the vessel, proceeding to roof in some old wigwams with green branches, as well as to construct a new one. I landed for a short time in the afternoon, and did not meet with anything of a noteworthy character; but some of the officers who were fishing met with a tolerable amount of success, capturing several specimens of a handsome fish, with a very broad head and rather large scales of a fine golden-yellow colour. This was the *Notothenia macrocephalus*, described some years ago by Dr. Günther, from a stuffed specimen said to be from the Falkland Islands, where, however, we did not encounter the species; and it is perhaps worth mentioning that Fortune Bay, where it appeared to be rather abundant, was the only locality in which it ever occurred to us. The

largest specimen, taken a day or two later, measured upwards of a foot in length. In the evening one of the men caught a handsome species of *Sebastes* (*S. oculatus*), of a fine scarlet colour. This fish had been previously recorded from Valparaiso, so that it is distributed over more than twenty degrees of latitude.

Next day (16th), which was moderately fine, heavy showers only falling now and then, in ascending a steep hill, upwards of a thousand feet in height, I obtained specimens of a pretty Composite plant, new to me—the white-flowered *Senecio trifurcatus;* and I was surprised by disturbing an upland goose and gander, with a brood of young ones, the only specimens of the species ever observed by me in the Channels. On my return to the beach, in struggling through a belt of wood, so dense was the undergrowth that I was compelled to walk for some distance along the branches of the trees, from the impossibility of reaching the ground.

The morning of the 17th was rather fine, and a good deal of excitement was caused on board by the appearance of a schooner in the distance. The Indians were the first to perceive her, and directed our attention to her by shouts and gesticulations, several of them pulling off in a canoe to meet her. We were for a short time in doubt as to whether she was coming our way, but she gradually bore down upon us under Yankee colours, and by-and-by anchored alongside. Soon after, one of the officers went on board of her, and learned that she was the "Mary Nason," under the command of Captain Sparkes, from Province Town, Massachusetts, bound on a whaling cruise, having left home six months previously, and passed through the Strait of Magellan.

The afternoon of that day was devoted by a party of us to a fishing expedition, and we captured a number of *Notothenicæ*, as well as a single specimen of the *Aphritis gobio*, first taken

at Port Gallant. Attached to it were some fine specimens of a parasitic Isopod, the *Pterelas magnificus*. In the evening Captain Sparkes, with his first mate, came on board, and spent some hours with us, giving us much information in a very pleasant frank manner, alike regarding Province Town and his own affairs. Next morning we weighed after breakfast, and proceeded northwards to Victory Pass to pick up the two boats left there a few days previously, parting company with our American friends, after towing them for a short distance on their northerly course, and then returned southwards, anchoring in the evening among the Otter Islands, which did not appear so dismal as at the time of our first visit to them in March, owing to the improved weather.

The 19th was a showery day. The dredge in the morning yielded some fine specimens of a bivalve, of the genus *Yoldia*, possessed of a large foot, apparently designed for burrowing in the fine mud of the bottom. Two of the officers, with myself, left the ship early, and spent the day cruising about among the numerous rocks and islands. Some oyster-catchers, a kingfisher, and a male and female of the common brown duck of the Strait, were shot, and on the beds of kelp we found a variety of Mollusca and Crustacea; one of the latter, now seen for the first time in abundance, being a curious Isopod, the *Cassidina emarginata*,* of which I afterwards found the British Museum possessed a single poor specimen from the Falkland Islands. They swam very rapidly on their boat-shaped backs among the fronds of the weed, on which they also crawled with considerable rapidity. On one of the small islands I noticed some large plants of *Veronica decussata* coming into flower. We tried fishing, but with very poor results, and returned to the ship at about five P.M. One

* Figured at p. 75.

of the men this day brought me a beautiful white *Doris* which he had found on the kelp, and a fish taken had a species of *Lernæocera* attached to one of its eyes.

The 20th was fair during the greater part of the day, but heavy rain came on in the evening. We remained at anchor, as it was Sunday, and next morning got under way, and moved southwards through Smyth's Channel, looking for harbours as we went along. We reached Sholl Bay on a fine bright evening, which remarkably contrasted with our former experiences in the same locality, gaining, shortly before we anchored, a magnificent view of various rugged gray mountains and snowy peaks, as well as of a glacier several miles in extent, fed by a dazzling snow-field at its head.

On the morning of the 22d the dredge yielded a specimen of the long-spined *Echinocidaris*, procured on the previous season, together with some Crustacea of the genus *Eurypodius*, and several dead shells of Molluscs, including valves of Terebratulæ, and of a small species of *Cardita*, the *C. Thouarsii*, described by D'Orbigny, from the Falkland Islands.* The day being bright and clear, we got under way after breakfast, and crossed the Strait of Magellan to the opposite Fuegian coast. As we approached it the appearance presented by its wall of precipitous gray mountains of the most wild and fantastic forms, rising sheer out of the water, was very remarkable in its excessive dreariness, well meriting Narborough's name of Island of Desolation. We first entered Tuesday Bay, which we found to be a very fine harbour, with a comparatively narrow entrance, and inside a large extent of water available for anchorage, and after taking some soundings there, made our exit, moving westwards to Port Mercy, a very unsafe anchorage, lying quite open to westerly gales. After scruti-

* A species of *Peronia* was also here obtained. It is figured at p. 75.

nising and pronouncing unfavourably upon it, we steamed back as far as Skyring Harbour, a most extraordinary nook in the cliffs. Here we would have remained for the night had the anchorage been good, but it was found that there was too little room to allow of the ship swinging safely, particularly as furious squalls, the "williwaws" of sealers, blew through the gorges of the hills at short intervals. At one corner of the harbour was a fine cascade, and it was curious to watch the water of it being blown upwards in sheets of spray during these squalls, which have been well described by Captain King in the following words. He remarks—

"The crews of sailing-vessels call them 'williwaws,' or 'hurricane squalls,' and they are most violent. The south-west gales, which blow upon the coast with extreme fury, are pent up and impeded in passing over the high lands; when, increasing in power, they rush violently over the edges of precipices, expand as it were, and descending perpendicularly, destroy everything movable. The surface of the water, when struck by these gusts, is so agitated as to be covered with foam, which is taken up by them, and flies before their fury until dispersed in vapour. Ships at anchor under high land are sometimes suddenly thrown over on their beam-ends, and the next moment recover their equilibrium as if nothing had occurred. Again a squall strikes them, perhaps, on the other side, and over they heel before its rage; the cable becomes strained, and checks the ship with a jerk that causes her to start ahead through the water, until again stopped by the cable, or driven astern by another gust of wind." "In many parts of this country trees are torn up by the roots, or rent asunder by the wind, and in the Gabriel Channel the 'williwaws,' bursting over the mountainous ridge which forms the south side of the Channel, descend, and striking against the base of the opposite shore, rush up the steep and carry all before them. I know nothing to which I can better compare the bared track left by one of these squalls than to a bad broad road. After having made such an opening, the wind frequently sweeping through prevents the growth of vegetation. Confused masses of uprooted trees lie at the lower ends of these bared tracks, and show plainly what power has been exerted."

After furling the rain-awning with which we were fortunately provided during this season, but which presented a surface of attack to the "williwaws," we left Skyring Harbour and returned to Tuesday Bay, where we anchored between seven and eight P.M.

The 23d was a day of heavy squalls, with calm intervals, when the sun occasionally appeared for a few minutes. Two of the officers, with myself, left the ship in the dingy soon after breakfast, and occupied the day in the investigation of the bay and its inlets, landing here and there as we considered advisable. On some cliffs we found a small rookery of cormorants, and in the nests were a few addled eggs, and several well-grown young birds covered with sooty black down. One of these, which fell over the ledge into the water, appeared to feel itself quite at home in that element, swimming and diving with great rapidity. A few brown ducks were also seen, as well as several kelp-geese, which were, however, exceedingly wary. The vegetation I found to be identical with that of the southern Channels, the prevailing shrubs being dwarf *Libocedrus*, *Metrosideros stipularis*, *Fagus betuloides*, and *F. antarctica*, the latter in a very stunted form; *Winter's-bark*, *Desfontainea*, *Berberis ilicifolia*, and *Escallonia serrata*, the bushes of which, now in full flower, appeared at a distance as if sprinkled with snow. No trees of any considerable size were to be seen; and as usual, *Donatia Magellanica*, *Astelia*, *Gaimardia*, *Myrtus nummularia*, etc., were among the commoner herbaceous plants on the wet slopes of the hills. Here, as throughout the Channels, *Mytili* were very plentiful, and a *Patella* was also common. The dredge only yielded a dead fragment of a Polyzoon. One of the surveying staff, who were busily engaged in their work this day, brought me in the evening two broken crania of the

fur seal (*Arctocephalus Falklandicus*) which he had found lying close to the beach, and on one of these was a small live *Helix*, which was afterwards unfortunately lost. One of the crania was curiously unsymmetrical, recalling that form of asymmetry in the half-lop rabbit's skull to which Mr. Darwin has directed attention, but of course dependent on a different cause.

On the 24th I landed with two of the officers, and leaving them to cook mussels over a fire which they kindled on the narrow strip of shingle which extended above high-water mark, I started on a solitary walk, ascending one of the steep hill-sides to a considerable height. About five hundred feet up, I found a pretty little plant with purple flowers, the *Ourisia breviflora*, for the first time. My progress being at length arrested by a series of bare precipices impossible to scale, I gradually descended towards the beach. In struggling through a dense thicket not far from the water, my attention was suddenly roused, when stepping from branch to branch of the trees, by a very strange sound in my immediate neighbourhood, and looking down from my perch, I saw a large otter running about, and gazing up at me, apparently much perplexed by my unexpected presence. On gaining the beach I found, close to the edge of it, some splendid bushes of *Veronica decussata*, some of them as much as twelve feet in height, and covered with the pretty fragrant white flowers. Fragments of *Lithodes antarctica* were lying about, but with this exception, hardly any vestiges of marine animals, save *Mytili* and *Patellæ*, were to be seen.

On the forenoon of the 25th, Christmas day, rain fell in torrents, but by the afternoon it faired, and a small party, of which I formed one, landed, to collect some evergreens wherewith to celebrate the occasion—a sprig of *Desfontainea*,

with the addition of berries made of sealing-wax, afterwards gracing the plum-pudding in the capacity of holly. We found a second cormorant rookery, and I took two young birds from the nest for the sake of their crania. The evening passed in the orthodox manner, various speculations being hazarded regarding the spot in which our next Christmas would be spent. The 26th was a showery day. We got under way after breakfast, and after executing some additional soundings in the bay, left it about noon, and proceeded eastwards along the coast of the Island of Desolation. Fortunately, there was almost no wind, which was a great advantage, as it permitted us to keep close to the coast, and so examine it very carefully for harbours. The first place entered was a deep inlet about three miles to the east of Tuesday Bay, at the head of which we saw some fine cataracts; and the next locality visited was Valentine Harbour, which proved to be of little value as an anchorage. We then continued eastwards for some miles, and between five and six P.M. entered by a narrow passage a very remarkable port (Churruca of Sarmiento) surrounded on all sides by high rugged hills, in the gorge of one of which a deeply-crevassed glacier, surmounted by an extensive snow-field, descended for some distance. After spending a short time in this harbour, we proceeded along the coast for a few miles farther, and then returned to it, anchoring about nine P.M. for the night. Here we remained at anchor throughout the 27th, which was Sunday, much rain falling, which caused us to mourn the absence of our awning. The evening was, however, fine, and between nine and ten P.M. there was a very striking lunar rainbow. On the 28th we left Port Churruca, and spent the day coasting along the Fuegian shore of the Strait on the look-out for harbours. The day was luckily calm, though

abounding in very heavy showers, so that a large amount of exploratory work was accomplished, and in the evening we crossed over to Playa Parda Cove, and there anchored. On the 29th we got under way early, and, leaving a couple of boats to survey the cove, passed westwards along the Patagonian coast for some miles, and then crossed to the Fuegian side, and entered a small harbour, Port Angosto, found the day before, anchoring for some hours to make a plan of it. Dr. Campbell and I took advantage of this circumstance, as usual, to land, and pass some hours on shore in investigation. We found progression extremely fatiguing, owing to the precipitous nature of the ground and the thickness of the trees, but lighted after a time on some open spaces on a long tongue of land, which allowed us to penetrate for some distance. As usual, the trees and shrubs consisted chiefly of *Libocedrus*, evergreen beech, Winter's-bark, *Metrosideros*, *Pernettya mucronata*, etc., and I obtained some specimens of the fruit of the last-named shrub, differing remarkably in form from the ordinary condition, the berry being of a conical form instead of rounded and depressed at the apex. I also found a tiny Composite plant, the *Lagenophora Commersonii*, for the first time, in great abundance, as well as many fine specimens of *Clarionæa Magellanica* and *Senecio trifurcatus*. We got under way between four and five P.M., and passed eastwards along the coast, crossing over at length to Playa Parda, and there anchoring soon after seven P.M. We found a party of Canoe Indians encamped at the entrance of the cove, and learned that they had visited the party left behind, but had given them no trouble.

On the morning of the 30th we left Playa Parda, and after proceeding eastwards for some miles along the coast of the Cordova Peninsula, in the course of which we gained a fine view of the large glacier in Glacier Bay, the colouring

and crevassing of which are alike magnificent, we crossed over to the Fuegian coast (Santa Inez Island), and anchored early in the afternoon in Swallow Bay. About half-an-hour later I landed, and ascended a hill on an island which forms part of the western boundary of the bay. Here I found a white-flowered Composite plant, new to me, and obtained very fine flowering specimens of *Pinguicula antarctica*. The bright scarlet blossoms of the *Embothrium coccineum* were also conspicuous in many spots of the hill, some of the plants covered by them not exceeding six inches in height. I also found some good specimens of *Galathea subrugosa* among the stones in the water close to the edge of the bay, and a beautiful pale rose-coloured *Eolis** was brought to me by one of the men.

The 31st was a dreary day of tremendous rain, with now and then a short break of fair weather. We remained at anchor till well on in the afternoon, when we set forth for Port Gallant, in pursuit of a brig which we saw pass the entrance of the bay, and thought was probably a provision vessel from Valparaiso which had been appointed to meet us at this time. We overtook her shortly before eight P.M., finding that our surmise was correct, and having procured our letters, left her to precede us to Sandy Point, while we anchored in Fortescue Bay, a number of us sitting up engaged in the perusal of our correspondence till the advent of the New Year, when, in conformity with an old custom, at the conclusion of the first watch at twelve P.M., sixteen bells were struck, eight in honour of the obsequies of the old year, and the same number in celebration of the birth of its successor.

* Figured at p. 75.

CHAPTER XIV.

BORJA BAY—TILLY BAY—FORTESCUE BAY—ELEGINUS—PORT FAMINE—SANDY POINT—GENTIANA PROSTRATA—ARRIVAL OF A PARTY OF PATAGONIANS — WAIT FOR THE MAIL-STEAMER FROM VALPARAISO, WHICH DOES NOT APPEAR — RETURN TO THE WESTWARD, AND MEET A SCHOONER WITH THE SHIPWRECKED PASSENGERS OF THE "SANTIAGO"—RECEIVE THEM ON BOARD, AND CONVEY THEM TO MONTE VIDEO — EXCURSIONS AT MONTE VIDEO — LEAVE MONTE VIDEO TO RETURN TO THE STRAIT — REVISIT THE GALLEGOS RIVER, AND FIND SOME FOSSIL BONES — REACH THE STRAIT — RIDE TO FRESHWATER BAY — PUMA CUB—PORT CHURRUCA—PORT TAMAR—MAYNE HARBOUR — CURIOUS HABIT OF HUMBLE-BEE — ISTHMUS BAY — OTTER ISLANDS — REMARKABLE SPONGES — AN OTTER-HUNT —MOUNT BURNEY—GOODS BAY—SHOLL BAY—FORTESCUE BAY —GUNNERA LOBATA—WOOD'S BAY—RETURN TO SANDY POINT, AND RECEIVE THE NEWS OF OUR RECALL TO ENGLAND.

On the morning of the 1st of January 1869, leaving two of the officers to execute the survey of Port Gallant and Fortescue Bay, we moved westwards along the Strait, examining the coast on either side, and after having narrowly escaped grounding on a bank off the entrance of the Batchelor river, we anchored in the evening in Borja Bay, on the north side of Crooked Reach, and Dr. Campbell and I landed and spent a couple of hours rambling about. Here, as in most localities visited by us, we came across several wigwams, as well as the remains of a bark canoe. The marine animal life appeared to be rather more varied than is generally the case in the western part of the Strait, and we obtained a variety of Molluscs,

Crustacea, and Echinoderms, including many fine specimens of *Chiton fastigiatus* and *Fusus laciniatus*, as well as a number of small live examples of *Lithodes antarctica*. Next morning we got under way, and crossed over to Tilly Bay, on the opposite Fuegian coast, where we spent some hours. Here some geese (*Chloephaga poliocephala*) were shot, and I obtained a number of specimens of a curious little fish, the *Harpagifer bi-spinis*, previously recorded from Cape Horn and the Falkland Islands, as well as several good examples of *Fusus laciniatus*, which were feeding on the *Mytili*, by means of drilling a circular aperture in the valves of the shell. Among the few plants procured in flower were the *Oxalis Magellanica* and the *Acæna pumila*. In the evening we returned to Fortescue Bay, and there anchored, being joined by the boats, and thereafter learning that the Indians had gathered in numbers in our absence, and given the surveyors some trouble. A small Yankee schooner, laden with cargo for Valparaiso, was lying at anchor in the bay, having arrived some hours previously. Her skipper came on board before long, and evidently felt very apprehensive of being attacked by the Indians, who in this part of the Strait have a bad reputation for piracy, and had been lighting gathering-fires in all directions. This evening we despatched a seining-party, and obtained a good haul of fish thereby, principally consisting of the *Eleginus maclovinus*, which furnished an agreeable variety to our monotonous diet of preserved and salt meat.

On the 3d, Sunday, we remained at anchor all day, and were visited by a few of the Indians, who, however, did not come on board. On the following morning we left the bay, and proceeded eastwards, passing Capes Holland and Froward, and anchoring in St. Nicolas bay about ten A.M., immediately after which two of the officers and myself borrowed the dingy,

and after pulling as far up the St. Nicolas river as the depth would permit of—namely, about a quarter of a mile—we spent some time cruising about the bay, where a specimen of grebe (*Podiceps major*), not uncommon in the Strait, but of which no examples had been as yet procured, was shot. The survey of the bay being completed by the afternoon, we weighed and went on to Port Famine.

On the 5th we remained at our anchorage during the first half of the day. In the morning the dredge yielded a magnificent specimen of the *Waldheimia venosa*, and after breakfast a party of us landed and spent some hours roaming about in quest of game and specimens. It was a very pleasant sunny forenoon, and I found a number of plants in flower on the open ground near the beach, including *Calceolarias*, Vetches, a yellow-flowered Orchid, *Cerastium arvense*, etc.; while the beautiful *Codonorchis Lessonii* abounded in some spots in the woods, and *Hippuris*, and a variety of sedges, were common in the marshes. In the afternoon we got under way, and went on to Sandy Point, which we had not visited for the last eight months. Here we found our provision-brig lying at anchor, and soon after our arrival Señor Viel came on board, bringing with him some letters left for us a short time previously by a passing vessel. On landing, on the following afternoon, we met our old friend the Patagonian chief, Cacimiero Biwa, in a state of inebriation, and learned that a large party of his tribe was expected before long. After inspecting the state of the vegetables in the garden of the Intendente, and making suitable remarks thereupon, Dr. Campbell and I set out on a walk over the open ground, rejoicing in being able to dispense with our sea-boots, which had been our necessary companions for the last two months. It was a lovely bright afternoon, and as we returned along

the beach the view looking westward was most beautiful; a sea of glass, out of which, on the distant horizon, rose several snowy peaks like icebergs, and overhead a pale green sky. The following day was also spent on shore by us, and in addition to specimens of several small birds not collected previously, I obtained three species of plants which had hitherto escaped my notice. Two of these were marsh *Ranunculi*, the *R. hydrophilus* and *R. trullifolius*, recorded by Dr. Hooker from the Falkland Islands, and the third, a pretty little Gentian, with bright blue flowers, the *G. prostrata*, found by Mr. Darwin at Cape Negro. The distribution of this tiny plant, as given by Dr. Hooker in the *Flora Antarctica*, is remarkably extensive. According to him, it occurs in Europe on the Carinthian Alps, at an elevation of from 6000 to 9000 feet; in Asia on the Altai Mountains; in North America on the Rocky Mountains, where it ascends to a height of 15,000 to 16,000 feet; and in South America, on the eastern side of the Cordillera. Its occurrence at the level of the sea in the Strait of Magellan thus affords a striking instance of the semi-alpine character of the flora of that region, which I have earlier commented on.

On the 8th a party of us rode up to see the deposit of coal in the woods, and to inspect the operations that were being carried on by some men for the procuring of gold in the bed of the stream, some specimens of the precious metal* having been discovered some time previously. We witnessed the process of gold-washing by passing a stream of water through a gently inclined wooden trough with stages of different elevations.

* Specimens of gold from this stream, which Señor Viel was kind enough to present to me, were sent home to the Museum of Practical Geology, London.

As Captain Mayne had determined to await the arrival of letters which we expected by one of the Pacific Steam Navigation Company's vessels, which, leaving Valparaiso on the 13th of the month, was due at Sandy Point on the 19th, we had some spare time on our hands, which some of the officers took advantage of, to start on a shooting expedition on the 11th to Elizabeth Island, while those of us who remained at the settlement were busily occupied in writing up our correspondence, etc. On the afternoon of the 15th, while Captain Mayne and I were walking over the plains to the northward, we descried a party of Patagonians in the distance, and before long they met us, presenting a very striking spectacle. There were about fifty adults, all mounted, and accompanied by a large troop of dogs. As they defiled along, clad in their guanaco-skin mantles, which were for the most part stained of a brick-red colour, with their bolas hanging by their saddles, and some with swords by their sides, they appeared to great advantage, several of the men being very handsome, and almost all of large size. The tallest, an old man with thick gray hair, was afterwards measured at the governor's house, and found to be six feet ten inches in height. Most of them, as they met us, contented themselves with smiling and passing on, but one or two stopped to speak to us, and one individual majestically motioned to me to pick up his bolas, which he had dropped. On their arrival at the settlement, they were greeted with a musical performance by the military band, and thereafter held an interview with the governor.

Our shooting party rejoined us on the 16th with a hundred and forty geese as the result of their labours, and I received from them a fine specimen of an old gander, which I subsequently skinned. We were by this time ready to start for the westward, to resume our work, as soon as the mail-steamer

from Valparaiso should make her appearance with our letters. The 19th, the day on which she was due, passed without her appearance, but at this we were not surprised, as we were informed that she was not unfrequently a day behind her time. As day after day, however succeeded, and there were still no signs of her, we began to be apprehensive for her safety, more especially as heavy south-westerly gales had been of late prevailing; and by the evening of the 23d we had entirely given up hopes of her arrival, and Captain Mayne accordingly determined on starting next day for the westward.

The 24th was a lovely day, perfectly calm in the morning, and most unusually warm, one of the thermometers registering 75° Fahr. in the course of the afternoon. At four P.M. we got under way, with our provision-brig in tow, Captain Mayne having made an engagement with her skipper to convey her to the western entrance of the Strait, as, owing to the prevalence of westerly winds, it is by no means an easy task for a sailing vessel to pass through the Strait from the eastwards, though a passage in the opposite direction is readily accomplished. We reached Port Famine on a fine moonlight evening, and there anchored for the night, a gun and rocket being held in readiness for the purpose of attracting the attention of the steamer should she happen to pass by us. Next morning we got under way and continued on our course, making slow progress in consequence of the wind being strong against us, so that we did not reach Fortescue Bay until the evening. On the 26th we weighed early, with the intention of proceeding as far as Port Angosto. It was a dull misty morning, causing us to realise that we were rapidly penetrating into the region of almost perpetual rain. Between nine and ten A.M. a small schooner was perceived in the distance bearing down in our direction, and

many speculations were hazarded as to whether she would afford us any intelligence of the missing vessel. As the distance between us was gradually lessened, we saw, to our great excitement, that she was crowded with people, and had in addition two boats in tow also packed with human beings. When she had arrived within a short space of us, a boat left her, which, on coming alongside of us, was observed to contain the skipper of the Yankee schooner which we had encountered in Fortescue Bay some weeks previously, and an officer in the uniform of the Pacific Steam Navigation Company's service. The latter, who, on stepping on board, proved to be the captain of the vessel expected by us, soon explained the disaster that had taken place. The "Santiago" had struck on a rock* at the entrance of Port Mercy on the 23d, and some hours later gone down, but the crew and passengers, with the exception of three, had been saved, having been landed in the boats immediately after the catastrophe took place at Port Mercy, where they had remained until the 25th, when two boats, which had been despatched to look for us, had observed the schooner bearing down along the opposite coast, and on reaching her had informed her skipper of their sad plight, on hearing which he at once crossed the Strait to Port Mercy, took them all on board, and then set sail for the eastward, hoping to encounter the "Nassau." Wonderful to relate, our mails had been the only ones out of a number carried by the vessel that were saved from the wreck, and we received our letters and papers in a damp but otherwise intact condition.

After some consultation between Captain Mayne and the captain of the foundered vessel, it was decided, as the best

* This rock, not laid down in the old charts, was found by us on the 22d of December 1868.

course to adopt, that, retracing our course to Borja Bay, which we had passed by a few miles, we should there receive the passengers on board from the schooner. The next point to be determined was, whether the shipwrecked company should be conveyed to Valparaiso or Monte Video, as we could not leave them at Sandy Point, there being not an adequate supply of provisions there to support them until the arrival of the next steamer about a month hence. Monte Video was at length fixed on, as agreeing most with the wishes of the generality of the people, many of whom were on their way to Europe. We reached the bay shortly before noon, followed by the schooner, which came alongside about an hour later; and soon her inmates, many of whom were remarkably attired in blankets, rugs, etc., trooped on board, our decks being crowded with a motley assemblage of about two hundred men, women, and children, of various nations, of which the English bore the smallest proportion. There were Peruvians, Chilians, Monte Videans, Argentines, Brazilians, Germans, French, Italians, and Portuguese; and their professions were nearly as equally diversified as their nationalities, comprising merchants, captains, opera-singers, hotel-keepers, the head of a large gambling establishment at Lima, and no less than five ecclesiastics of different sorts. Of these last, two were very unpleasant dirty-looking old wretches, with straw hats, horn spectacles, and long gray garments, who might have sat for pictures of Reinicke Fuchs on pilgrimage; a third was a stout old gentleman in black, of a gouty and gluttonous appearance; the fourth was a young Jesuit with a most painful expression of countenance, the skin resembling parchment stretched over the bones; while the fifth, a fine-looking elderly priest with a splendid beard, clad in a long brown garment, and who had showed an admirable example in the way of exer-

tion at the time of the wreck, was, I believe, a missionary from Chiloe.

After receiving our living freight, we parted company with the schooner and provision-brig, the former of which proceeded westward, while the latter followed us to the east with the intention of going round the Horn. Leaving Borja Bay, we went on under steam all night, and arrived at Sandy Point between five and six A.M. on the morning of the 27th. Three hours later we got under way, and proceeding eastwards under sail and steam, cleared the eastern entrance of the Strait late in the evening.

I need not enlarge on the details of our daily life during the voyage northward, which was made entirely under steam, as we had light head-winds nearly all the way, though fortunately steadily fine weather, a rare occurrence between the Plate and Strait. I will leave to the imagination of the reader the amount of dirt, and heat, and squalor, produced by so many human beings so closely cooped up, with breakfast going on all the early part of the day, and an uninterrupted stream of dinner proceeding throughout the afternoon. It was fortunate that we had filled up with provisions before this unexpected accession to our numbers took place, else we would have been badly off for food. We entered the mouth of the Plate on the morning of the 4th of February, but made very slow progress for some hours, as a strong tide was running against us. In the evening of the preceding day a sad event had taken place—a man who had been dismissed from the English hospital at Valparaiso on account of incurable heart-disease, having died suddenly, and this morning he was buried at the mouth of the river. The early part of the night was characterised by a marvellous display of sheet-lightning, and early next morning we reached Monte Video,

where we found our old friend, the "Narcissus," lying. Shortly after we anchored, a small steamer came alongside, and nearly all the passengers took their departure for the shore in her, giving three cheers for the "Nassau" as they bid us farewell.

We spent a fortnight at Monte Video very agreeably; the weather, with the exception of one or two violent pamperos, which sometimes detained us on shore unexpectedly, being gloriously bright and fine, though oppressively hot; but there being almost no shade to be met with, owing to the absence of trees in the country round about the town, pedestrianism was decidedly fatiguing. The Carnival began at noon on Sunday the 7th, and lasted for about three days, during which numerous processions of people in grotesque masks perambulated the streets, while the inmates of the houses assembled at their windows and squirted perfumed water at the passers-by, who, in general provided with syringes, returned the compliment. One fine morning Dr. Campbell and I went over to the Mount with an old friend, a lieutenant in command of a gunboat, and spent some pleasant hours rambling about in search of plants, etc. I here obtained fine specimens of a handsome lizard (*Cnemidophorus lacertinoides*), of a vivid green colour, with several longitudinal narrow white bands. It was very common, but ran with such excessive rapidity that I was almost in despair of procuring any examples, only succeeding at last owing to the skill possessed by one of my companions in the art of stone-throwing. I also found two species of Amphibia, one a toad, the *Bufo agua*, and the other a beautiful species of *Hyla*, which was basking on rocks in the sun. This, the *H. agrestis*, one of Mr. Darwin's numerous discoveries, was of a grass-green colour above, and yellowish-white beneath, with the back of

the thigh marked with black and white spots, and a well-marked white streak on the edge of the upper lip, and along the outer side of the leg, between the knee and ankle. The occurrence of a species of this genus in an absolutely treeless district is noteworthy.

Another day I walked with the same companions to visit a celebrated "quinta," or country-seat, the property of a German gentleman, Mr. Buschenthal. It was an extremely hot day, and the walk along dusty roads fringed with American aloes, many of which were in flower, recalled our first impressions of the vicinity of Monte Video. Mr. Buschenthal was from home when we arrived, but we spent some hours very pleasantly strolling about his grounds, where great numbers of *Eucalypti*, together with a variety of fine Coniferæ, were growing. We visited the hothouses, which contained beautiful tropical plants, including some splendid orchids and ferns. In one of the conservatories a chamaeleon was slowly crawling about, and we were much interested in watching its motions. The rapidity with which the extraordinary tongue was protruded to take flies from our hands was wonderful. After leaving the quinta, we returned to town by a different route, passing a variety of cottages, each shaded by the umbrageous foliage of the large Ombu, one of the few trees to be seen in the district. A few days later, in the course of a long walk under a blazing sun, I witnessed a curious sight—observing a green *Mantis* perched on a low bush, with a white butterfly in its grasp, which it was devouring piecemeal, its unfortunate victim, one wing of which was nearly eaten away, making vain struggles to escape.

Having filled up a second time with coal and provisions, we intended to have left Monte Video on the 19th, but were prevented by the coming on of a furious pampero, in

the course of which the down from the great thistles with which the plains are covered was blown over the bay in such a manner as to exactly counterfeit a snow-storm. The gale continued during most of the 20th, falling gradually towards the evening, and on the morning of the following day, which was brilliant, calm, and warm, we weighed, and began to retrace our way to the south. A favourable breeze sprang up in the course of the afternoon, and at eight P.M. we ceased steaming, and went on under sail throughout the night, keeping up an average of eight knots for some time. The following day was very bright and warm, with comparatively little wind, but what there was in our favour. The breeze freshened somewhat towards evening, and about ten P.M. we were going smoothly at a rate of about six knots, when those of us who were seated quietly reading down below were startled by a sudden shout, and the noise of a scuffle on deck, and immediately afterwards learned, to our dismay, that there was "a man overboard." Sail was at once shortened, and a boat immediately lowered, which, pulling rapidly from the ship, gradually disappeared from our view in the darkness. Ten minutes later a second boat was despatched, and the ship put about. This boat likewise soon disappeared from view, in spite of the light of the lantern which she carried, and an interval of anxious expectation succeeded, broken at length by a loud hail, soon after which she was descried not far off with the missing man, who, fortunately for himself, had been a good swimmer, on board. A blue light was then burned to attract the attention of the first boat to our position, and before long she made her appearance, and we resumed our course.

Heavy rain came on at two A.M. on the morning of the 23d, and continued for between four and five hours, the wind

afterwards dying away almost entirely, so that we made very little progress throughout the day. I tried the towing-net, but with no result. Rain again set in shortly before ten P.M., and lasted throughout the night, and on the following morning, by way of variety, we had a fresh breeze right in our teeth, compelling us to tack, so that we accomplished very little way. During the afternoon the breeze freshened into a gale, and by the evening we were under reefed topsails, and frequently shipped heavy seas. The wind moderated considerably during the night, but by the morning of the 25th freshened again, and was as foul as ever, while a thick mist brooded over the troubled water. Later in the day it was blowing as hard as ever, and great flocks of petrels and albatrosses were flying round the vessel. By the morning of the 26th, however, matters were greatly improved, though the wind was still foul, and we found at noon that we had only made about 250 miles from Monte Video, which was not satisfactory. It was dead calm during the greater part of the 27th. In the morning we put over a large dredge in forty fathoms water, and kept it down for about an hour, but with very poor results, one or two specimens of a small *Echinus* common in the Strait, a *Pagurus*, and a minute species of Gasteropod, being the only animals obtained. Early on the 28th a favourable breeze arose, and we went along smoothly throughout the day with studding-sails set. On the following morning (March 1st) it was blowing fresh from the S.E., but we were able to make pretty good progress in the desired direction, and on the 2d we had a fair wind, which helped us materially on our way. The 3d was a beautiful day, but nearly calm. There was a gorgeous sunset in the evening, followed by a fine moonlight night. The 4th was in most respects a repetition of the 3d, while the 5th was a dull

cloudy day, with a rapidly-falling barometer, which caused us to anticipate a gale. Early in the afternoon, while a number of us were standing abaft, a seal made its appearance, and remained for some time diving about close astern of us, and a few hours later a small land-bird flew on board, and being captured was brought to me. Under the circumstances I could not be so hard-hearted as to make a specimen of it, and so tried the experiment of feeding it with a little water and crumbs of biscuit, which appeared to have a beneficial effect, as the little creature, which at first seemed in a dying condition, gradually revived, and at last flew off. We anxiously watched the appearance of the weather at this time, as we were desirous, if possible, to revisit the river Gallegos before entering the Strait, in order to institute a further search for the deposit of fossil bones which we had failed in discovering on the previous season. Heavy rain came on during the evening, and in the middle of the night a gale set in from the S.E., but soon changed to the S.W., and by the morning of the 6th of March it was blowing furiously off the land, and the vessel rolling so heavily as partially to immerse some of her boats, suspended at their davits at a very considerable height, in the waves. By the evening, however, the wind had become less violent, and the sea had gone down, so that we were able to stand in towards the entrance of the Gallegos, and early on the morning of the 7th we made Cape Fairweather, the characteristic forms of the Friars and the Convents disclosing themselves as we gradually approached the mouth of the river. The tide was against us, so that we made very slow progress, and did not fairly reach the entrance till about two P.M., when, after vainly endeavouring to get into the river, and being foiled by the numerous sandbanks, we anchored at some distance outside.

The morning of next day was very fine, though with a slight W.N.W. breeze blowing down the river. After breakfast we made our preparations for the trip, and at half-past ten A.M. a party, consisting of Captain Mayne, six of the officers, and myself, left the ship in the Captain's galley and steam-cutter, the latter of which took the former in tow. The tide was against us when we started, and continued so till we were well into the river. As usual, cormorants, filled with a spirit of curiosity, came flying round the boats, but were allowed to escape uninjured. Our first adventure was furnished by the steam-cutter grounding on a bar at the south side of the entrance, which caused us to make a slight detour, and a little later, when we were off Loyala Point, also on the south bank, the same boat broke down, and anchored to repair damages. The wind was by this time freshening considerably, and Captain Mayne therefore decided on moving farther up the river in the galley, and there awaiting the arrival of the cutter. Setting forth, after a hard pull we reached an island off the northern shore, and there anchored in shelter. Landing for a few minutes to scrutinise the neighbourhood, we came across a flock of five flying steamer-ducks, two of which were shot, and one preserved for a specimen. Before long we were joined by the cutter, which had broken down a second time since we parted company, and being again taken in tow by her, we proceeded onwards. Soon the wind very inconveniently changed round to S.W., so that we were no longer under shelter under the north bank, and the tide, which had turned in our favour, making against it, caused a very unpleasant chopping sea, which wet us pretty thoroughly. After passing an elevation, Gallegos Hill of the chart, and when about four miles below the commencement of the long range of cliffs, about fifteen miles

distant from the river's mouth, which we intended to explore for the desired fossils, the steamer again broke down, and it was accordingly determined that we should not proceed farther. We therefore landed in the galley, got the gear on shore from the two boats, and pitched the tents. The galley was then hauled up in course of time, while later the steamer was beached at high water. While these arrangements were going on we strolled out in different directions to survey the prospect, Captain Mayne and I walking a few miles in the direction of the cliffs. On our way we observed a beautiful hawk, with brown and ash-coloured plumage, but did not get a shot at it, as well as numerous carranchas, which, as usual, kept a sharp look-out on our proceedings. I found, to my disappointment, that nearly all the plants, with the exception of a common yellow-flowered *Senecio*, had passed out of bloom, so that I was unable to replace the specimens so unfortunately lost on our previous visit. Close to the edge of the river the *Euphorbia*, then noticed, and a curious leafless, probably Polygonaceous plant, with oddly jointed stems, which I had found in the course of our first season at Direction Hills, occurred plentifully, the latter covered with seed. We did not observe any guanacos or ostriches, though many fragments of the skeletons of both were scattered about, and there was abundant evidence that pumas were common in the neighbourhood.

Next morning (9th) we rose at half-past six, and, immediately after we had breakfasted, made our preparations for going up the river to the cliffs—a guanaco, meanwhile, appearing, and watching our proceedings at a safe distance. At eight the greater number of us started in the two boats, the cutter, as on the former day, taking the galley in tow. Many specimens of a large crested grebe were to be seen

swimming about, and gulls and terns were flying over the water in flocks. In about half-an-hour the unfortunate steamer broke down, and halted to repair damages, and we proceeded on alone, after a tedious pull reaching a long sand-spit dry at low water. Here we intended to land and walk on to the cliffs, but our purpose was defeated by the discovery that the spit in question was not a peninsula, but an island. Accordingly, joined by the steamer, which again took us in tow, we proceeded onwards till we arrived opposite the first deposit of fallen blocks at the foot of the cliffs. The cutter was then anchored in the stream, while we pulled in towards the shore in the galley till she grounded, when we landed, armed with picks and geological hammers for our work. After examining the first accumulation of blocks, and finding in the soft yellow sandstone of which certain of them were composed some small fragments of bone, we proceeded to walk along the beach, carefully examining the surface of the cliffs and the piles of fragments which occurred here and there at their base. The height of the cliffs varied considerably, and the highest portions, averaging about 200 feet, extended for a distance of about ten miles, and were evidently undergoing a rapid process of disintegration, a perpetual shower of small pieces descending in many places, and numerous large masses being in process of detaching themselves from the parent bed. They were principally composed of strata of hard clay (sometimes almost homogeneous in its texture, and at others containing numerous rounded boulders); soft yellow sandstone; sandstone abounding in hard concretions; and lastly, a kind of conglomerate, resembling solidified, rather fine gravel. The lowermost strata, as a rule, were formed of the sandstone with concretions; the middle of the soft yellow sandstone, which alone appeared to contain organic remains;

and the upper, of the gravelly conglomerate and hard clay. Nearly the whole of the lower portion of the cliffs, as well as all the principal deposits of fallen blocks, were examined by us in the course of the walk, and we met with numerous small fragments of bone, but very few specimens of any size or value occurred, and the generality of these were in such a state of decay as to crumble to pieces when we attempted, although with the utmost amount of care that we could bestow, to remove them from the surrounding mass. To add to this, the matrix in which they were imbedded was so exceedingly soft as not to permit of being split in any given direction. The first fossil of any size observed by us was a long bone, partially protruding from a mass, and dissolved into fragments in the course of my attempts to remove it. At some distance from this a portion of what appeared to be the scapula of a small quadruped, with some vertebræ, occurred, and farther on one of the party (Mr. Vereker) directed my attention to a black piece of bone projecting from one side of a large block near its centre. This, which was carefully removed at the expense of a large amount of labour, with a considerable amount of the matrix surrounding it, by three of the officers, to whose zeal in rendering me most valuable assistance in my work I shall ever feel deeply indebted, afterwards proved to be a most valuable specimen, for on carefully removing more of the matrix when we returned to the ship, I found that it was the cranium of a quadruped of considerable size, with the dentition of both upper and lower jaws nearly complete.* As no other specimens of importance were discovered, we re-embarked towards

* This specimen, a description of which may be expected ere long from Professor Huxley, is, I am informed by that gentleman, the type of a new genus allied to *Anoplotherium*.

the close of the afternoon, and reached our camp at about six P.M., learning on our arrival that Dr. Campbell had had the good fortune to shoot a guanaco at a considerable distance from the tents. This, as he had no companion with him, he had been obliged to leave on the plains, to be carried in afterwards, having most ingeniously contrived to eviscerate it with his penknife, in the course of which process he had discovered a young embryo, about half the size of a mouse, which he had brought in for my behoof. After a hearty dinner, which we felt was well earned by our hard day's work, and a long and pleasant talk, we retired to rest, intending to return to the ship next morning about eight A.M.

On the 10th several of us rose at five for the purpose of taking a walk over the plains before breakfast, and three of the men were despatched to carry in the carcass of the guanaco, which was a very large one, to our camp. On our return to the tents to breakfast, we learned that we could not start as originally intended, as the tide, having been driven back by a strong breeze that was blowing, had not come high enough up to float the cutter, which, packed with our gear, was too heavy to launch. We therefore very contentedly abandoned ourselves to another day's experience on shore, and after breakfast dispersed in various directions, Captain Mayne, Dr. Campbell, and I, taking a long walk to the mouth of the river, in the course of which a handsome plover (*Oreophilus ruficollis*) was shot, and I obtained a single plant (a lingering specimen of a species of Valerian) that was new to me.

On the 11th we rose at seven A.M., and two hours later embarked and proceeded down the river, reaching the vessel shortly before noon. On our arrival we got under way for the Strait, a south-west gale soon after rising. Between six

and seven P.M. we anchored outside Dungeness, and here we were detained during the following day, as it was blowing hard from the S.W. I filled up my spare time in skinning and carefully examining the flying steamer-duck, whose external characters agreed in all respects with King's *Micropterus Patachonicus*, and found, on examination of the skeleton, that it was that of a young bird, the skeleton being imperfectly ossified, and a thick perichondrial layer investing the sternum, which was very thin, rough, and porous in texture.

The gale was over by the morning of the 13th, and we therefore got under way soon after four A.M., and went onwards to Sandy Point, dropping one of the boats off Peckett Harbour to effect some necessary soundings there. On reaching Sandy Point at nine P.M. we were surprised by finding no less than three vessels lying at anchor, which proved to be a Chilian man-of-war, the "Ancud;" the schooner of Captain Luis Piedra Buena, whom we met at the Falkland Islands in the course of the previous season; and our provision-brig, the "Rosario Isabel," which we expected would have nearly reached Valparaiso by this time. We afterwards found that a sprung mainmast, which had to be replaced by a new one from Valparaiso, was the cause of her detention. The wind rose during the night, and next morning, when we came on deck, Sandy Point presented a more dismal appearance than we had ever before seen it exhibit—the day being dreary in the extreme, a strong wind blowing and causing the vessel to roll severely, heavy rain descending, and a violent surf breaking on the beach, so as to render it impossible to land. The wind fell, however, in the course of the evening, and the morning of the 15th was calm and sunny, with a decided touch of frost in the air. Dr. Campbell and I landed as usual to spend the day on

shore, and had a long walk over the plains, where some plovers and several species of *Thinocorus rumicivorus* were shot, and a number of geese and "bandurrias," and a couple of spur-winged lapwings, were observed.

The beach was strewn with kelp, uprooted by the recent gales, and many specimens of *Lithodes antarctica*, *Serolis Orbigniana*, the large *Echiurus* discovered in the course of the first season, and a variety of other marine animals, scattered about, but I observed nothing that was new to me.

Two days later, Captain Mayne, with three of the officers and myself, rode to the Chilian outpost at Freshwater Bay, a distance of about twenty miles by the track. The morning was dull and cloudy, but the sky gradually cleared, and the ride was a very pleasant one, our route lying partly through and in part along the edge of the thick forests of the antarctic beech, which were beginning to exhibit fine autumnal tints. We took a little over three hours to reach the outpost, where we were very politely received, and regaled with an excellent "casuela," the unfortunate fowl furnishing the stock of which being caught before our eyes. Soon after our meal we remounted and rode back to Sandy Point, which we reached soon after five P.M., finding that the squadron off the settlement had been increased by the arrival of H.M.S. "Ringdove," on her way from England to Valparaiso.

On the 19th I was presented by one of the crew of Captain Luis Piedra Buena with a puma cub, a charming little creature, about twice the size of a domestic cat, with a great round head and beautiful hazel-brown eyes. Unfortunately, however, it had sustained some injury to its spine, and did not survive long. I fed it with preserved milk, dissolved in warm water, during the few days I kept it on

board, and this it drank with great satisfaction, licking the last drops off my fingers with its rough tongue.

The 20th was chiefly marked by the arrival, at four A.M., of one of the Pacific Steam Navigation Company's vessels on her way to England. She brought us a supply of letters and papers from Valparaiso, and afforded us an opportunity of despatching a mail. We got under way for the westward at four P.M. on the following day, and proceeded onwards all night. The following evening we anchored at Port Angosto; and at noon on the 23d we reached Port Churruca, where we remained for the day to make a plan of the anchorage. The afternoon being fine, Dr. Campbell and I borrowed the dingy and spent some hours pulling about, landing here and there. A specimen of large black petrel, not uncommon in the western part of the Strait, but of which I never succeeded in obtaining a specimen, was sailing about the harbour, and several kelp-geese, steamer-ducks, and cormorants of two species, were seen. One of the latter, which was shot, disgorged about half-a-dozen small fish in a partially digested condition. As was my general custom, I made a collection of the plants of the port, but, with the exception of the *Viola tridentata* and a species of *Uncinia*, observed hardly any species with which I was not already familiar. Under some stones I found a few specimens of an Oniscoid Isopod, which were afterwards unfortunately lost. The morning of the 24th was bright, but very cold. Snow had fallen during the night on the lower mountains, adding to the wintry effect produced by the large masses of perpetual snow on the more elevated peaks beyond. We left Port Churruca early in the afternoon, and crossed to the opposite shore of the Strait, anchoring in Port Tamar, in the south-western corner of King William IV.'s Land, soon after five P.M.

Next morning we found that there had been a very heavy snowfall on the Fuegian mountains during the night, and for some hours there was a series of the most beautiful fleeting effects of sunshine on the snow, varied by huge snow-clouds sweeping along the Strait, so as to conceal the opposite shore from view. The dredge yielded a very fine specimen of an Echinid of the family *Spatangidæ*, a live *Terebratula*, and many examples of a small species of *Leda*. I spent the afternoon along with Dr. Campbell in visiting the shores of the port and the small islands at its entrance, but did not observe anything worthy of mention, if I may except a snipe (*Gallinago Paraguiæ*), which was shot on one of the islets.

The 26th (Good Friday) was a cold, dreary day of perpetual rain; and the 27th was chiefly marked by the arrival of the "Ringdove," which we had left at Sandy Point engaged in wooding. Much rain fell during the day, but Dr. Campbell and I spent a few hours pulling about the harbour, in the course of which we obtained a species of cormorant (*Phalacrocorax Magellanicus*) new to us. The 28th (Sunday) was a day characterised by heavy showers, and on the ensuing morning we got under way, and entered Smyth's Channel, the "Ringdove" following in our company. We passed two canoes with some of our old friends in them, who waved their cloaks and yelled after the customary manner, and came to an anchor among the Otter Islands at four P.M. Next day we weighed between four and five A.M., and proceeded as far north as Mayne Harbour, which we reached late in the afternoon. Rain descended in floods throughout nearly the whole of this day and the next, continuing till the afternoon of the 1st of April, when, though it did not cease, it moderated sufficiently to permit of a walk, and Dr.

Campbell and I accordingly landed and ascended one of the rugged gray syenite hills, about a thousand feet or more in height. The geology of the Channels, I may here remark, appears to be of a singularly uniform character, syenite being the prevailing formation, and here and there dark veins of greenstone occurring. Around this harbour the summits of nearly all the mountains are flattened and tabular, and almost entirely destitute of any vegetation higher than lichens. In the course of our ascent I was much interested by finding in the clefts of the rocks, at the side of a small stream, a variety of the curious plant found at Port Grappler, differing from the form first obtained in the much stouter branches and more closely aggregated leaves. The first specimens observed occurred at an elevation of about 600 feet; and I again found the plant almost at the summit of the mountain. All the specimens had passed out of bloom. A curious cryptogamic plant, noticed for the first time, was the *Jungermannia splachnophylla*, recorded by Dr. Hooker from Cape Horn, the branches of which are so thick and crisp as to break readily across.

It rained hard all that night, and next morning there was wind in addition. I occupied the afternoon in visiting the environs of various parts of the beautiful harbour, following the course of a stream for some distance, on the banks of which I found a fine species of *Carex*. We had been a good deal perplexed for some time past by observing that three-fourths of the flowers of *Desfontainea spinosa*, which is very abundant, as I have already observed, in the western part of the Strait and Channels, and was at this time in full bloom, were perforated by a rather large aperture near the base of the corolla, and this day we discovered the cause of the injury. A large orange humble-bee (*Bombus*

Dahlbornii), already noticed, is common in these dreary regions, and, owing to its size and the narrowness of the aperture of the tube of the flower of *Desfontainea*, which is blocked up by the anthers of the stamens, is unable to enter by the mouth to suck the honey-like fluid at the base. It therefore bites a hole in the side of the flower near the base, and inserts its head there. We watched the process carefully several times, as I was anxious to make out whether this insect played any part in the fertilising of the flower, and I finally came to the conclusion that it did not, as the stamens are quite removed from the part of the corolla attacked by it.

On the 3d, leaving a party to finish the survey of Mayne Harbour, we moved northwards to Puerto Bueno to execute an uncompleted piece of work. Arriving there about noon, we parted company with the "Ringdove," which continued her northerly course. I passed the afternoon on shore, but, with the exception of the discovery of a single dead and worn *Concholepas* shell, met with nothing of interest. We returned to Mayne Harbour next morning, and remained there for the rest of the day. We weighed on the morning of the 5th (one of the most utterly dismal days we had yet seen, with the hills shrouded in mist, heavy rain descending, and occasional tremendous squalls), and, moving southwards, anchored in Columbine Cove, in Piazzi Island, in the afternoon. The following morning was tolerably fine, but a good deal of snow had fallen during the night, and the temperature was decidedly frigid. I spent an hour on shore, while some of the officers were taking sights, and walked over the narrow peninsula which separates the cove from Shingle Road, but observed nothing remarkable. The only sign of life was furnished by the little *Cinclodes Patagonicus*, which was diligently searching the masses of kelp on the beach for

the marine animals contained therein. We got under way after our return on board, and proceeded northwards, occupying the day in a search for harbours, and entering many beautiful inlets in the mountains, at the head of which extensive glaciers and snow-fields were displayed. We returned to our anchorage at the close of the afternoon, and the following day passed southwards to Isthmus Bay on the western side of the base of the Zach Peninsula. Finding this to be an excellent anchorage, we remained to execute a survey of it, and Dr. Campbell and I landed, and spent the afternoon on shore, crossing the lowest portion of the narrow isthmus from which the bay derives its name, and which connects the Zach Peninsula, at one time evidently an island, with the mainland. This we found had been employed as a portage by the Indians to Oracion Bay in Union Sound. We remained at anchor throughout the 8th, to complete the plan of the bay. The weather was tolerably fine, and accordingly a small party spent the day in pulling about the bay, landing now and then. Several flying steamers were observed, one with exactly the plumage of the non-volant form, and the others attired like the specimen obtained at the Gallegos river. Two were shot, and I afterwards carefully examined their skeletons, finding that the bones showed unequivocal evidence of immaturity. On the afternoon of the 9th we left the bay, and moved southwards to our old anchorage among the Otter Islands.

The 10th was fair, though rather cloudy, and as we remained at anchor a party of four of us borrowed the dingy in the morning, and passed a very pleasant day in pulling about among the islands. On this occasion, I was so fortunate as to obtain specimens of three fine sponges, new to me, and probably hitherto undescribed. All were of large size, and

one, the largest of the three, possessed expiratory orifices from half to three-fourths of an inch in diameter. This species was of a pale straw colour, with a thin outer rind, easily broken, a coarse horny skeleton, and an abundant supply of yellow fluid matter, which contained numerous solid yellow specks, probably the ova. The second form was of a brilliant orange-yellow tint; and the third, of a firmer consistence than the other two, was of a pale grass-green hue. They generally occurred at a depth of ten or eleven feet, where we perceived them by leaning over the side of the boat, and gazing downwards through the clear water, dislodging them with much trouble with the end of an oar's blade. I greatly regretted being obliged to cut up these splendid specimens, in order to preserve them, as the damp weather entirely prevented the possibility of drying them.* Towards the close of the afternoon we had a most exciting otter-hunt. Several of these animals were observed playing about among the beds of kelp, and one was severely hit, but after floundering about for a few minutes, swam rapidly off, while we pulled after it with our utmost speed, getting within a few yards of it. It, however, dived repeatedly, and at last vanished from our sight for a time. We had been eagerly watching for its re-appearance for a few minutes, when we heard the most piteous cries that I think I have ever listened to from an animal, and saw it at some distance with its head above water, clinging to the foot of a steep bank. It was a truly harrowing sight, and cooled down my sporting ardour very thoroughly for the time. A few minutes later, the poor creature disappeared, having probably gone down to the bottom to die, and we saw no more of it.

* I hope, ere many months have elapsed, to describe these species, which I have not as yet had sufficient leisure to examine with care.

The 11th was a day of indescribable beauty. Before I left my cabin in the morning I noticed, with wondering admiration, the golden light on the bare syenitic hills ; and on coming on deck I found, to my delight, that the entire mass of a magnificent solitary mountain* a little to the northward, in general shrouded more or less in mist, and the summit of which we had never seen, was revealed, without a cloud to dim the dazzling splendour of its jagged snowy peaks, the extensive snow-fields which clothed its sides and the deep blue crevassed glaciers which filled its gorges. The sky was cloudless, save for a few delicate cirri, the air perfectly still, and the entire mass of the mountain, the rugged granite hills around, and the trees on the islands, were all reflected on the unruffled surface of the lake-like water. There was that aspect of quiet sublimity over the whole landscape which only occurs when there is a tinge of frost in the air. All day long the prospect remained clear, and exhibited a series of effects impossible to describe, but ineffaceable from the memory; and as the sun declined, the white form of Mount Burney became first suffused with rose-colour, and then steeped in deep purple.

On the 12th we left the Otter Islands, passing southwards to Good's Bay. The weather was fine, but the sky again covered with cloud, and the tops of the higher mountains concealed from view. Here we anchored to await the return of several of the boats absent on surveying work, and as usual several of us spent the day in the exploration of the vicinity. A *Nycticorax obscurus*, a black cormorant (*Phalacrocorax Brasilianus*), and some kelp-geese, were shot, and the preservation of a specimen of a fine male of the last-named birds occupied me pretty fully on the 13th, during which much rain fell. The two follow-

* Mount Burney, nearly six thousand feet in height.

ing days, when we remained at anchor, were occupied in excursions to Renouard Island, opposite the bay, in the middle of the Channel; and on the morning of the 16th, all the boats having returned, we proceeded onwards to Sholl Bay, arriving there before ten A.M. In the course of the morning I accompanied Captain Mayne and one of the officers on shore, and had a stiff climb of about 600 feet with them to the summit of the shoulder of a hill, where was a huge angular block (about six feet high by eighteen long and broad) of gray granite, from which they took a series of angles, while I investigated the neighbourhood without much result—*Viola tridentata* being the only plant at all scarce which I procured. It rained and blew violently while we were in this elevated position, which we quitted shortly before noon, getting on board about an hour later. The following morning we weighed early, and on leaving Sholl Bay and entering the Strait encountered a very heavy swell. It was evidently blowing hard outside the western entrance, as shown by the appearance of numerous albatrosses, Cape pigeons, and fulmar and stormy petrels. On our way eastwards we met the Pacific Steam Navigation Company's vessel "Magellan" *en route* for Valparaiso, and halted for about a quarter of an hour to hold communication with her. In the evening we reached Fortescue Bay, and there anchored.

Next morning we were joined by H.M.S. "Boxer" from the eastward. Heavy showers fell throughout the morning, and towards the close of the afternoon steady rain set in, while snow fell on the mountains. We remained at anchor during the 19th, and three of the officers and myself spent the earlier part of the day in Port Gallant. In ascending one of the neighbouring hills I again found the plant first discovered at Port Grappler, and also obtained excellent fruiting

specimens of a species of *Gunnera* (*G. lobata*), found by Dr. Hooker at Cape Horn. This species is not uncommon in the western part of the Strait, and differs from the *G. Magellanica* in the possession of glossy lobed leaves, together with a variety of other characters not calling for mention in this place.

On the 20th we left Fortescue Bay in the morning, and moved eastwards as far as Wood's Bay, whither one of the boats had preceded us on the previous day. Here we spent nearly three hours, and two of the officers and I pulled about a quarter of a mile up a river which opens into the head of the bay, landing after a time on the left bank, and scrambling up to a tract of comparatively level ground, where I found a few specimens of the Port Grappler plant for the fourth and last time. At the entrance of the river we found two wigwams, one of which was much more carefully constructed than is usually the case, and of a different form and larger size, being about five yards long by nearly two broad, and with two entrances. This was the only wigwam not of the beehive form that I ever observed in the Strait or Channels. In the woods I obtained specimens of a pretty little moss, the *Hypopterygium Thouini*, first noticed at Eden Harbour. Early in the afternoon, the survey of the bay having been completed, we moved onwards, reaching Port Famine about nine P.M., and next morning we proceeded to Sandy Point, and anchored there at noon. Immediately thereafter a boat came off from the shore with letters which the "Magellan" had left for us a few days previously, and we then received the unexpected intelligence that we were ordered home. The news was productive of very mingled feelings, some of the members of our company being rendered very glad by the prospect of a speedy return to England, and others rather regretting that the

cruise would be rendered shorter by a year than had been originally anticipated by us. After a few days' sojourn at Sandy Point, in the course of which we repeated some of our familiar rambles for the last time, everything being at length in readiness for the northerly voyage, we bid farewell to the settlement on the afternoon of the 27th, moving on as far as Laredo Bay. On the 28th we continued our course, anchoring in the evening in St. Jago Bay. The day was cold and bleak, with heavy showers throughout the morning, but the weather improved towards the afternoon, in the course of which there was a magnificent double rainbow, with both arches complete, and dipping into the water, and the inner of the two possessed of a supplementary ring of rose colour. There was a brilliant sunset, succeeded by a beautiful clear moonlight night. On the 29th we weighed between four and five A.M., and on the afternoon of the same day, with a bright sun overhead, we passed out of the Strait for the last time, and some hours later Cape Virgins disappeared from our gaze.

CHAPTER XV.

RIO DE JANEIRO—EXCURSION TO PETROPOLIS AND ST. JUIZ DA FORA —ASCENT OF TIJUCA PEAK—VARIETY OF FERNS, ETC.—LEAVE RIO—SARGASSO SEA—THE AZORES—FAYAL—RIDE TO CALDERA —FERNS—LEAVE FAYAL, AND ARRIVE AT SPITHEAD.

AFTER a rather tedious voyage of about three weeks, during the earlier part of which we experienced much bad weather, we reached Rio de Janeiro at sunset on the 20th of June, and four days later Dr. Campbell and I left the ship on a few days' excursion to Petropolis and St. Juiz da Fora, the former place (thus named from its furnishing a summer residence to the Emperor) being situated in the heart of the Organ mountains, and the latter, separated from it by a distance of a little over a hundred miles, in the district of Minas Geraes. Taking our places on board a steamer which left the city at two P.M., we proceeded rapidly up to the head of the bay, which, with its wooded shores and numerous islands, presented all the appearance of a magnificent lake. Arriving at the Porto de Maua in about an hour and a half, we there found a train waiting to take the passengers on board the steamer to the foot of the mountains. In a few minutes later the train started, and we were whirled along at a speedy rate through a low-lying tract of country, marshy in some parts, and abounding in the most luxuriant vegetation. We reached the foot of the Serra, the terminus of the railway, between four and five, and got into a landau, one of a series of vehicles by which the remainder

of the journey is accomplished. Leaving the railway station at half-past four P.M., we followed the course of a steep and very tortuous road winding through the mountains. It was a clear bright afternoon, and the evening light shed over the head of the harbour behind us and the richly wooded slopes on either side, before the sun went down, was exquisitely soft and mellow. The drive was thoroughly enjoyable, the air, as we gradually ascended, becoming delightfully cool, and the scenery strikingly beautiful. In many spots the high banks were covered with tall Melastomaceous shrubs, with large mauve-coloured flowers; in damp nooks and corners splendid Begonias, with large clusters of pink flowers, and great glossy leaves, dark-green above and deep crimson below, displayed themselves, while ferns and palms of the most exquisite forms everywhere abounded. After attaining an elevation of about 3000 feet, we passed through a sort of gateway in the mountains, and then gradually descended to Petropolis, which lies in a narrow valley, and consists of a long principal street, through which a stream flows, with one or two at right angles, and a number of detached houses on the outskirts. It was a lovely moonlight evening when we reached the little town, and the English hotel being shut at this season, owing to the scarcity of visitors, we dismounted at the Hotel Braganza, and on inquiring, as usual, whether English was spoken there, received a brisk reply in the affirmative from a little stout Frenchman, with his hair cropped short on the crown of his head, who proved to be the landlord, and immediately began to talk the desired language with considerable fluency. After being conducted to our room we were informed that dinner would he ready in about half-an-hour, when the coach from St. Juiz da Fora was expected, an event which we anxiously

longed for, as we were getting very hungry. The vehicle in question appeared before long, and at seven we sat down to dinner, after which we set out on a stroll in the moonlight. It was a night of such perfect beauty, and the air so refreshingly cool, that we walked out for at least three miles before thinking of retracing our steps. The palms and bananas appeared singularly fine in the moonlight, as their fronds were stirred by a passing breeze, and as we walked along we were treated to an extraordinary concert, furnished by cicadas and frogs of various species ; nearly the only drawback to our happiness being produced by the ferocity of the dogs belonging to the cottages which we passed, to provide against whose attacks we were obliged to arm ourselves with stones.

Next morning we rose at seven, and as we were informed that breakfast would not be ready till between nine and ten, we employed the time at our disposal in a short walk. At breakfast, when the landlord sat at the head of the table, we were the only guests, and we had much talk with our host, who informed us that he had spent some years in England between 1830 and 1840, mentioning the names of a number of celebrated people and places that he had seen. He evidently thought that London contrasted most unfavourably with Paris, remarking that Paris was all white, while London was all black, but went into raptures over the beauty of Edinburgh, and condescended to say that he liked the English mode of living better than the French style, as being more tranquil, observing that he had been over at the Exposicion, and had considered the Parisian life too bustling after the Brazilian quiet way of living. In the absence of any cicerone to tell us what was most worth seeing in the neighbourhood, we decided on following the road we had traversed the day before ; and accordingly, after breakfast, set

forth with our folios of drying-paper under our arms, and after ascending to the crest of the ridge, walked a long way down the winding road leading up from the railway terminus. The day was beautifully clear, a comparatively rare event at Petropolis, where it frequently rains, and we had in consequence a magnificent view of the harbour, and the flat ground between it and the Serra. The walls, rocks, and banks, were fringed with ferns of many beautiful and curious forms, and a very considerable variety of flowering plants, among which *Begonias* and *Melastomaceæ* prevailed largely, were in bloom. At one spot we followed a beautiful little stream for some distance up the wooded hill-side down which it flowed, passing numerous great boulders covered with *Bromeliaceæ*, orchids, ferns, and trailing *Cacti*, including a species of *Cereus* with lovely rose-coloured flowers. Returning to the hotel late in the afternoon, we had dinner, and another charming saunter in the moonlight terminated the evening. Next morning we were roused at half-past four, and after a slight refection of coffee, and bread and butter, got into a fly, and were driven to the coach-office, from whence the coach to St. Juiz da Fora started.

It was a bright moonlight morning, and everything was so quiet when we arrived, that we began to speculate on our having mistaken the time, but before long four mules were led out of a neighbouring stable, and harnessed to the diligencia, which then drove round to the office, where we took our places behind the driver, and soon set out at a rapid pace, being joined by several other passengers before we left the town fairly behind us. By-and-by the sky began gradually to redden, and there was a fine sunrise, followed by a bright clear morning. The road, along which we drove at a rate of from nine to ten miles an hour, is an admirable one, con-

structed by the União E Industria Company, who, I believe, enjoy a monopoly of the entire traffic, and possess three thousand mules for the service of the diligences and waggons. The stages are at about an hour's distance from each other, and as we were supplied with fresh mules at every stage, an admirable rate of speed was maintained, the mules being splendid animals, and so ready to take to the road that the leaders were not fastened to the traces till the moment of our departure. The route, throughout nearly its entire extent, passes through the most splendid scenery, winding along by the side of hills covered with virgin forest, between plantations of oranges, coffee, and mandioca, and in the immediate vicinity of rivers foaming over their rocky beds. I was greatly delighted with the variety of beautiful flowers and brightly-coloured birds and insects, many of which we had not observed in the neighbourhood of Rio. At Entre Rios, thus named on account of its situation between the Parahyba and Parahybuna rivers, and about midway between Petropolis and St. Juiz da Fora (where the coaches from these places meet the Pedro Segundo Railway, which at the time of our visit had its terminus there), we halted for an hour, and had a substantial Brazilian breakfast, after which we continued our journey. Serraria was, if my memory serves me right, one of the next places we stopped at, and between this and Parahybuna we drove for some distance through an avenue of tall bamboos, the tops of which, bending over, formed a series of regular Gothic arches. On reaching Parahybuna, we passed from the province of Rio Janeiro into that of Minas Geraes, and soon after, when we were nearly midway between that place and the next stage, Simão Pereira, the sky to our dismay began to darken, and as we were passing along the side of a steep hill rain descended in

sheets, soaking us pretty thoroughly. At Simão Pereira, where we dismounted while the mules were being changed, we saw a beautiful sickle-billed humming-bird sucking honey from the flowers of a *Gladiolus* in a small patch of garden-ground in front of a house. It began to get dark by the time we reached San Mathias, the last stage in our journey, and after passing it we drove on in the darkness between thick woods, halting after a time at a place whose name I did not ascertain, where was only a stable for mules. Here we got fresh quadrupeds for the last time, as well as lights to guide us on our way, and again pursued our course. A few miles from St. Juiz da Fora the ground on either side of us was low and marshy in its character; and here there was the most magnificent display of fireflies which I have ever witnessed, hundreds of these insects flitting about in every direction, some flying so high as to counterfeit falling stars; and others, when seen through the trees, deluding us into the belief that we saw the lights of dwellings. We got into the town between seven and eight, not having the most vague idea as to what hotels it possessed, or which we should select; and as all our fellow-travellers were Brazilian, and only spoke Portuguese, of which our knowledge was very limited, we were not able to derive much information upon the subject from them. However, we dismounted at a hotel where several of the other passengers left the coach, entering a low one-storeyed building, at the doorway of which a group of people were congregated, and were immediately conducted by a youth to a clean, but very meagrely-furnished, double-bedded room, with a door about twelve feet high. I then began the usual formula of—"Do you speak English?" but received an emphatic shake of the head, and having tried "Parlez vous Français?" and "Sprechen sie Deutsch?" with the same

negative result, we felt rather in a fix as to how to explain our wants. The youth, however, disappeared for a moment, returning with a stout elderly gentleman, who asked us, in an unmistakable German accent, what we wanted, telling us that he spoke very little English, but that he understood it pretty well, and that he would explain to the people of the hotel (who, he said, would "trate" us very well) what we wished. Thanking this good Samaritan for his timely assistance, we told him that we wanted dinner in the first place, and that we intended spending the morrow at St. Juiz, leaving it next day for Entre Rios. All this he kindly undertook to represent, and before long we had sat down to a very good dinner abounding in Brazilian dishes, including the universal Feyjaõs e Farinha. After dinner we had a long talk with our friend, who gave us a good deal of information about the place, which stands about a hundred feet or more lower than Petropolis, and, as I have already mentioned, is about a hundred miles distant from it. He informed us that a colony of twelve hundred people of his nation were established at St. Juiz, some of them being located in the town, and others inhabiting a neighbouring village, Colonia, and said that he would have liked to have shown us all that was worth seeing in the vicinity, but that he was unfortunately obliged to go to Parahyba next day on business. He informed us that we ought to visit the chacara or farm of a certain Don Mariano, the said chacara appearing to be *the* lion of St. Juiz. In giving us directions how to proceed, he said, "You will go the gate of the chacara, and you will say to the negro man at the gate, I *will* see the chacara of Mariano."

After enjoying a sound sleep after our long journey, we got up next morning (27th) between seven and eight, the youth of the night before, who seemed to be factotum of the

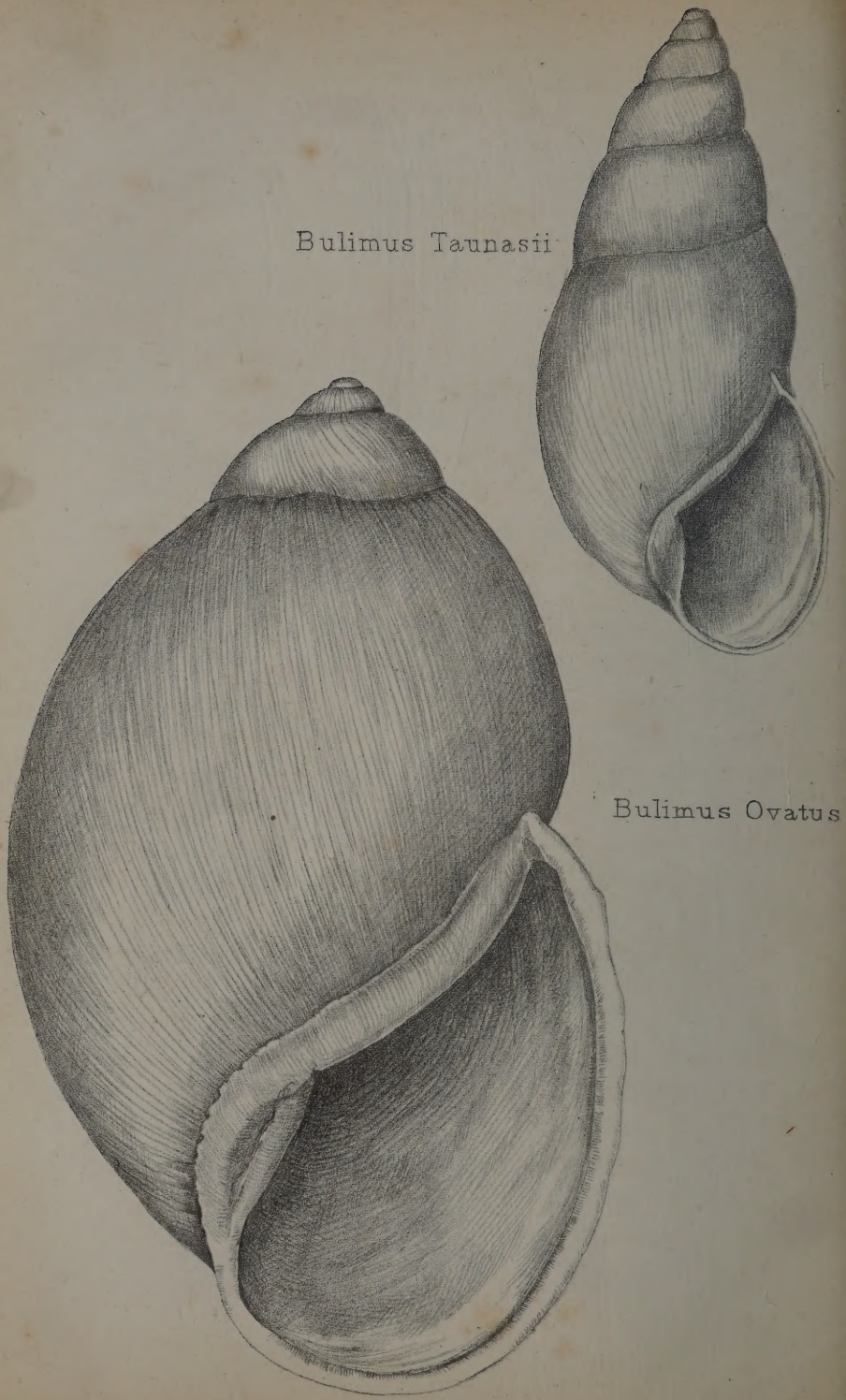
establishment, and who was extremely anxious to show us all attention, endeavouring to make the utmost use of a very few English words which he proved to be possessed of, on making his appearance, demonstrating to us that he understood the directions he had received the night before —announcing "breakfast ten clocks," "dinner four clocks," "to-morrow five clocks," shaking me by the shoulder at the same time, to convey to us the impression that he would rouse us at that hour; "six clocks, Entre Rios," meaning that the coach started then for that place. He, moreover, succeeded in explaining to us that after breakfast he would conduct us to the celebrated chacara, by pointing to Dr. Campbell, himself, and myself, and announcing "Mariano chacara lookee." After breakfast we were disappointed to find that heavy rain was falling. Fortunately, however, this state of things did not last long, and we took a stroll in the outskirts of the town, observing in a marsh hundreds of specimens of the British royal fern, *Osmunda regalis*, growing. After a time we set out with our friend, who had attired himself gorgeously for the occasion, and managed to carry on a large amount of conversation with him by our reciprocally mentioning the English and Portuguese names of the various objects we saw. After a short parley with a little negro boy who acted as porter at the gate of the chacara, we entered the grounds, which we found to be very tastefully laid out, and well kept. There was a small menagerie, including a cage of monkeys and several other mammalia, and a variety of birds, among which were some fine Curassows, and a specimen of the Agami (*Psophia crepitans*), which stalked up to the front of its cage to contemplate us, emitting its very curious drumming note. After leaving the grounds, and stopping for a few minutes at a venda,

where our guide was anxious to treat us to English beer, we took a stroll by ourselves through the town, which we had not yet seen by daylight, finding that it presented a very picturesque appearance, consisting principally of a single long street, with two fine palm-trees growing at each side of the road at either end. It was a public holiday in consequence of some Roman Catholic festival, and there was much music, vocal and instrumental, proceeding from the different houses. It was curious to observe such a number of unmistakably German physiognomies, and to hear such an amount of German spoken, receiving from many of the people whom we met a "Guten morgen," instead of the customary "bonas dias." We visited an old burial-ground on a height, where a tall black cross was erected, with representations of the pincers, nails, the hammer, the spear, the sponge, and other implements associated with the crucifixion, appended to it. At the close of the four o'clock dinner we sauntered out on the coach-road for some miles. We here saw some very large ant-hills, and spent a considerable amount of time watching the industrious little creatures carrying great burdens of red earth, cemented into pellets, to the entrance of the galleries, where they poised them for a moment, and then let them fall down the steep side of the hill. Farther on, we found an army of large black ants stretching across the road, and forming a belt about nine inches broad, which was visible at a distance of many yards. Darkness settled down long before we returned to the village, but we were lighted on our way by the fireflies, which, as on the previous evening, were flitting about in myriads.

We were roused in due time on the morning of the 28th, and, after a light breakfast, started at six by the coach for Entre Rios, which we reached at noon, and after breakfasting

there, took our departure by the train, which started for Rio at one P.M. We were imprudent enough to select a carriage near the end of the train, a step which we afterwards repented of, as the most recently constructed part of the line was exceedingly rough, and the oscillation in consequence greatly exceeded what we had ever before experienced in travelling by rail. The country through which the line passes is very beautiful, lying at first for some distance along the banks of the Parahyba river, and afterwards crossing the Serra do Mar, which I had previously seen on our former visit to Rio. As the distance between Rio and Entre Rios is fully a hundred miles, and we had previously driven fifty from St. Juiz da Fora, we were not sorry when we reached the Brazilian capital between seven and eight P.M.

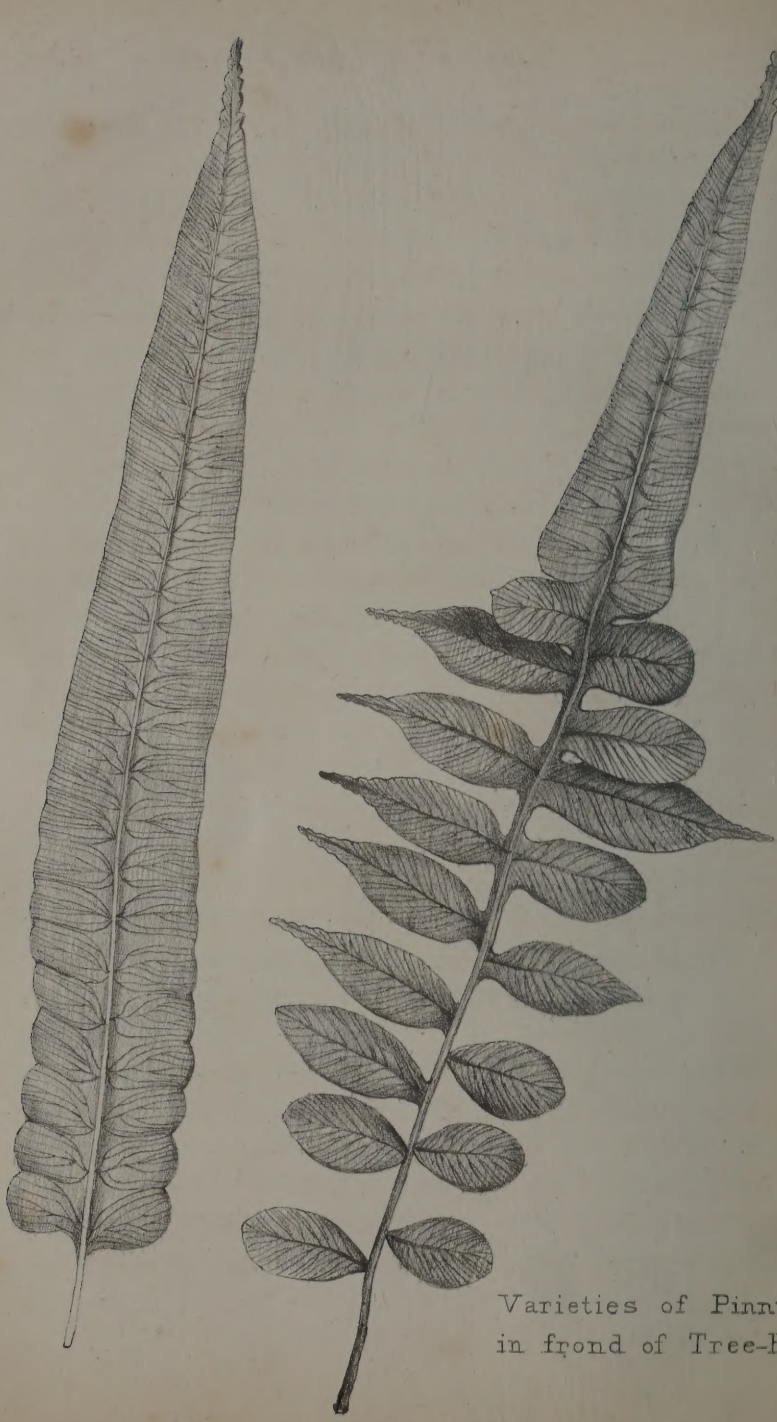
The remainder of our stay at Rio was principally occupied by Dr. Campbell and myself in long walks about the vicinity. On the 1st of June we landed in the morning to accomplish the ascent of Tijuca Peak, 3316 feet in height, and celebrated for the extensive view to be gained from its summit on a clear day. Walking to a plaza at the head of the Rua do Ouvidor, from which many of the coaches set forth, we took our places on the top of a 'bus which started soon after, and carried us as far as Anderahy, at the foot of a steep hill which divides the great valley in which Rio lies from the much narrower Tijuca valley beyond. Toiling along the winding road which conducts the traveller up the side of this hill, with many groans over the heat, we at length reached Boa Vista, at the summit, and having refreshed ourselves with a draught of Vino Tinto and water at a venda, and invested in some bread at a padaria, we started for the peak, passing the elegant little cascade


Bulimus Taunasii
Bulimus Ovatus

(Cascada Pequena) well known to all who have visited Tijuca, and following a road which, winding along a low rounded hill, brought us at length to the foot of the proper peak. Here we encountered two diverging paths, and, after some consideration, decided on following one which appeared to lead in the proper direction. After pursuing this for a short distance, however, it suddenly diminished into a narrow track, which lay through the thick woods with which the mountain is covered. This we followed for some time, although not without certain misgivings that we were mistaken in our route. We still persevered, nevertheless, till the track became lost, and then spent a considerable time in fruitless endeavours to struggle through the dense undergrowth—a most fatiguing task, owing to the twiners which everywhere barred our progress, tripping us up, and cutting our fingers with their rough rind when we attempted to break them. After some time occupied in this manner, we came to the conclusion that, if we were to reach the top of the mountain that day, the only course that lay open to us was to retrace our steps, find the other path, and pursue it. This we accomplished, though not without considerable difficulty, on our way out of the thicket finding two dead shells of the *Bulimus ovatus*, of one of which I give a sketch, to illustrate the great size to which land-shells attain in these regions.

After striking into the proper path we followed it at a rapid pace, in order to reach the summit of the peak before sunset, as the afternoon was now wearing on. The route takes a zigzag course, running at some points at the foot of dark gray granite precipices, and the last part of the ascent, which is very steep, is accomplished by means of steps cut in the rock.

We reached the flat summit at half-past four, and there beheld one of the most wonderful views that it had ever fallen to our lot to contemplate. The harbour, with its numerous islands, the sea outside to the north and south, and the country around, were all spread out before us as in a map, and steeped in the most exquisite serene evening sunlight. The distant mountains were of a delicate purple tint, with here and there only just enough haze resting on them to add to their beauty. From our lofty situation we counted no less than fifty-four rocks and islands in the harbour. We remained enjoying the prospect till after five P.M., when we began to descend, as the sun was rapidly going down, and we were anxious to get on our way before the darkness should overtake us. It was long past sunset when we got back to Boa Vista, but a magnificent starlight night, many fireflies adding to the illumination. After halting at a venda to refresh ourselves after our exertions, we began to descend the hill to Anderahy, but not until we had occupied a few minutes in gazing with admiration at the splendid spectacle presented by the city of Rio, which, brilliantly lighted up, resembled a large delta formed of streams of fire. On the following day we visited the remarkable valley of boulders below Tijuca, and two days later walked to the sandy sea-beach beyond Botafogo, where, on a former occasion, I had observed the swift-running crabs. Not far from this beach I met with three species of sensitive plants, all distinct from that observed on our visit on the way out to the Botanic Gardens. Of these, one was a *Mimosa*, a second appeared to be referable to the genus *Cassia*, while the third, which was the most feebly sensitive of the lot, was an *Æschynomene*. On marshy ground, not far from the beach, a stout coarse-growing fern, the *Chrysodium aureum*,



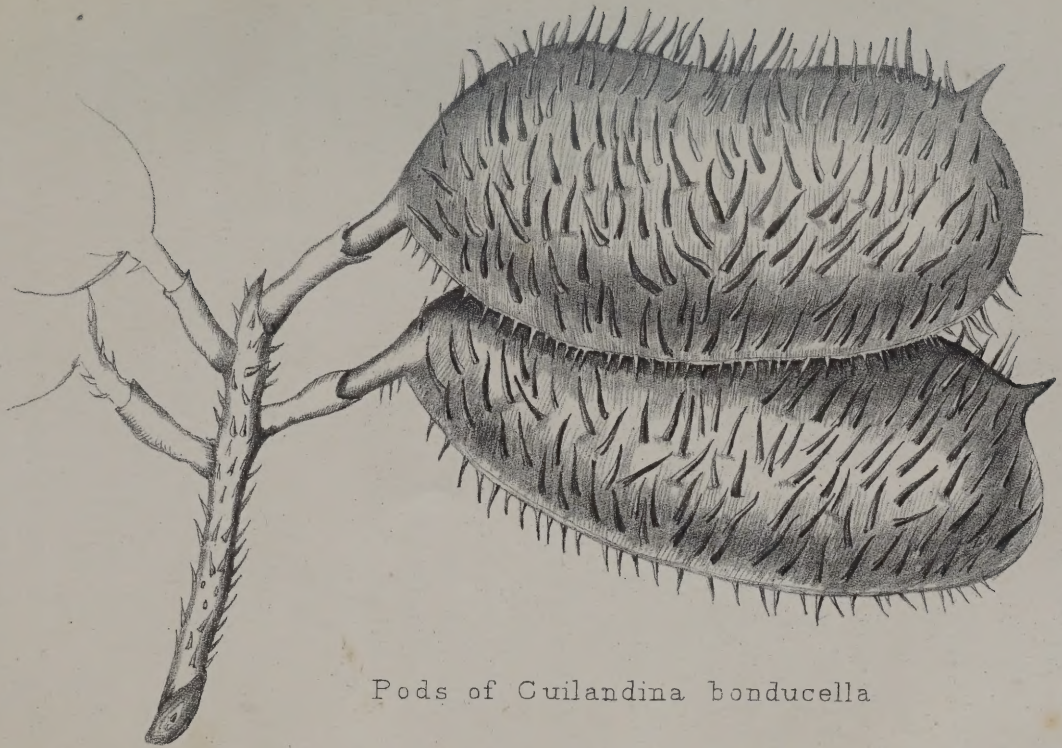
Varieties of Pinnules
in frond of Tree-Fern

was growing luxuriantly. On a tract of sandy soil two other species of the same order, the *Goniophlebium neriifolium* and the *Asplenium suspensum*, the latter of which also occurs in the forks of trees, were observed; while on the white sand above high-water mark, the trailing stems of a Leguminous plant, with pretty purple flowers, extended for fathoms. The 5th was devoted to an ascent of the Corcovado, and the wonderful view from the top was again duly admired. Several fine tree-ferns were met with on the way, and I was much struck with the extraordinary amount of variation displayed in the pinnules of a single frond of a species whose name I have not ascertained, but which was probably an *Alsophila*. I preserved specimens from various parts of the frond, and I figure a couple of them, as I think they furnish a striking warning to those palæontologists who do not possess a very intimate acquaintance with botany, of the danger of error to which they are liable in describing detached fossil leaflets as distinct species. A very common but handsome fern, at a certain height up the mountain, was the *Hemidictyum marginatum*, the simply pinnate fronds of which sometimes exceed ten feet in length. As I have earlier stated in the course of this narrative, few things in Brazil made a more powerful impression on my mind than the wonderful diversity of form and habit presented by this class of plants. It would be asking too much of those who have had the patience to follow this chronicle thus far, were I to pass minutely in review the various species commonly to be met with in the neighbourhood of Rio; but it may tend to give some idea of their wonderful profusion, when I state that on a single day's ramble a sedulous collector may obtain a greater number of species than are to be met with in the whole of Great Britain.

This day I made two additions to my collection of Amphibia —one being a species of toad, the *Bufo ornatus*, and the other of the Hylina, the *Phyllomedusa bicolor*, a very pretty little creature of a vivid grass-green colour above, and light yellowish-white beneath, with the sides spotted with purple. Several of the officers at this time made a trip to the head of the harbour, and on their return brought me specimens of a Leguminous shrub (*Guilandina bonducella*), with curious prickly pods enclosing round hard gray seeds.

The weather was now extremely hot and close, and as sickness was rapidly spreading among the ship's company, two of whom we had the misfortune to lose through a very malignant form of typhoid fever, Captain Mayne decided on proceeding to sea with as little delay as possible. The necessary supplies of coal were therefore taken in on the 8th, and at four P.M. on the following day we moved slowly out of the harbour, with a long homeward-bound pennant flying from the mainmast.

Our ensuing experiences were of a very monotonous character, and the great heat of the weather tended to produce much inactivity alike of mind and body,—one of the few occupations available to those who, like myself, had a considerable amount of idle time on their hands, consisting of lounging about the gangways watching the *Velellæ*, *Physaliæ*, and other floating animals. On the 1st of July we passed the islands of Brava and Fogo, the most southern of the Cape de Verdes, and in the evening of the following day we reached St. Vincent, where, as we were placed in quarantine, we only remained for a single day to take in a supply of fuel, and then continued our northerly voyage, passing through the N.E. trades, which carried us far to the westward of our



Pods of Guilandina bonducella

course. On the 13th we passed through a quantity of gulf-weed (*Sargassum bacciferum*), extending in long parallel belts along the surface of the water, and on the portions obtained I found specimens of two of its well-known denizens—the Nudibranchiate *Scyllæa pelagica*, and a small crab (*Planes minutus*) with a square flat carapace.

On the morning of the 18th two of the Azores, Fayal, and the adjacent island, Pico, were sighted, the remarkable peak of the latter (between seven and eight thousand feet in height) rising above a bank of white hazy cloud. As in the course of the afternoon we approached Fayal, the aspect of its southern coast appeared strikingly beautiful, contrasting strongly with the desert-like appearance of St. Vincent. Immediately above the water extended a very remarkable belt of bare rugged volcanic cliffs, projecting here and there into bold headlands, but beyond this, up to the level of a belt of cloud, which concealed the highest portion of the land from view, the entire surface of the country was richly cultivated, being most minutely divided into rectilinear fields, diversified with bright green and rich yellow tints—the former, as we afterwards found, being produced by crops of immature maize, and the latter by ripe barley. Nearly all the fields appeared to be surrounded by hedges of a sort of bamboo, or some allied plant, and there were no traces of roads to be seen, the result, as we subsequently ascertained, of most of them lying at a much lower level than the fields. After a time it became cloudy, and we apprehended rain, but only a few drops fell, the weather thereafter clearing up, and the evening becoming fine and bright. On reaching the entrance of Horta Bay, immediately after rounding a promontory excavated by a very remarkable caldron-shaped hollow, with a narrow entrance to

the sea (the Caldera Inferno), a pilot-boat came off to us, but we declined to avail ourselves of her services, and she therefore returned to the shore to inform the governor of our arrival. As we steamed into the bay, which lies open, permitting the entrance of a considerable swell at times, the little town of Horta presented a very attractive appearance, with its bright whitewashed houses scattered over the slope of a rather steep hill, and interspersed with trees, whose foliage exhibited an agreeable variety of shades of verdure. The only vessels lying at anchor in the bay were a Portuguese man-of-war and a few small merchant vessels.

We anchored about four P.M., and in a short time the health-boat, with the doctor and governor, and an interpreter, came alongside, and after a string of questions relative to the health of the ship's company had been satisfactorily answered, we were granted "pratique." Thereafter a number of boats came alongside, with eggs, fruit, and a variety of other articles for sale, the inhabitants of Fayal, like those of most Roman Catholic countries, entertaining no scruples on the score of carrying on trade on Sundays. The only fruits ripe at this time were apricots and small plums, and oranges, which we had expected to procure, we were informed, were not cultivated at all in Fayal, notwithstanding that San Miguel is such a noted locality for them. Vines, we were told, were grown at one time, but not now, Pico being, at present, the wine-producing island. Eggs were cheap, about sixpence a dozen. The British acting consul, Mr. Lane, came on board immediately after we had obtained "pratique," and from him we received a considerable amount of information with regard to the island, which possesses about 25,000 inhabitants, of which 7000 are located in Horta. The Azorean popula-

tion are much discontented on account of the heavy taxes which are imposed upon them by the Portuguese government, and not long before our arrival a revolution had broken out in San Miguel and some of the other members of the group, to quell which Portuguese troops, to the amount of seven or eight hundred, had been billeted over the islands, having been transported from Portugal by the man-of-war now at anchor in the bay.

It was such a beautiful evening that a few of us were tempted by the long light to land after dinner and spend a couple of hours on shore, strolling through the town, and out into one of the country roads sunk beneath the level of the fields. The streets appeared very clean, and the inhabitants, in general, struck us as healthy-looking, and much less sallow than the natives of southern Europe generally are, a result probably due to the fine climate and exhilarating sea-breezes. Two circumstances specially arrested our attention while passing through the town, one being furnished by the flocks of bats which were flying about, and the other by the attire of the ladies, who wore long dark blue cloaks, with huge stiff hoods, somewhat like poke-bonnets, measuring about a foot in height, and nearly twice that amount from back to front.

Arrangements having been entered into for a riding-party to visit a wonderful caldera, or crater, at the summit of the island, between three and four thousand feet above the level of the sea, four of us breakfasted early next morning, landing thereafter between seven and eight A.M., and walking to the consulate, close to which we found our donkeys, strong sturdy animals, in the care of donkey-boys, awaiting us. The saddles were sufficiently odd-looking structures,

being stuffed with hay, covered with canvas, and provided in front and behind with two upright crossing bars, which serve to hold on by when riding sideways, which we found was by far the most comfortable position. They were also padded by having a loose cushion laid over them, and as there were no stirrups, we found it a work of some difficulty to scramble into our seats. This at length accomplished, we trotted off briskly, accompanied by two attendants, one a boy of about twelve, who carried my large vasculum, and the other a youth of eighteen or nineteen, who ran behind us, armed with a kind of goad, which he freely applied to the rear of our steeds, accompanying his blows with shouts of, "Ha! shackass; get on, shackass." After riding for a considerable distance along the roads between the fields, which were in some cases bounded by thick hedges of *Hydrangeas* from four to six feet high, presenting a splendid appearance from being loaded with great heads of bluish-purple flowers, we at length left the cultivated district behind us, reaching a tract of moory ground where only a few sheep and cattle were feeding. In the course of our route I was greatly interested by the general character of the plants, several of which were identical with British species, and not observed by me since our departure from England. Thus the purple heather of our Scottish moors and mountains (*Calluna vulgaris*) was plentiful, together with the common juniper, and other familiar plants. A handsome heath, the *Dabœcia polifolia*, which occurs in the west of Ireland, was also common; and a remarkable ivy-leaved fern, the *Asplenium Hemionitis*, which I had not previously seen, and which also inhabits the south of Europe and north of Africa, as well as Madeira, the Canaries,

Asplenium Hemionitis

the Cape de Verdes, was abundant in the crevices of the roughly constructed walls.*

As we gradually ascended higher and higher up the mountain, the track became extremely bad, the donkeys finding much difficulty in keeping their feet, and one of them not seldom subsiding under its rider, but without detriment either to itself or him. Pursuing our onward and upward way, we were now and then enveloped in thick masses of mist, which did not permit us to see far in front of us. We noticed several species of birds, quails among the number, and at intervals an unseen thrush sang melodiously. At length we reached the lip of the crater, which at first presented the appearance of a gulf of mist. This, however, soon cleared off, and before we commenced the descent we gained an excellent view of its wonderful cavity. It is always difficult, without actual measurement, to form an accurate estimate of the dimensions of anything of the kind, but, as nearly as we could judge, it was almost circular, about half-a-mile in diameter, and six or seven hundred feet in depth. The sides, which were in general grown over with grass and low shrubs, were exceedingly steep (in certain places nearly perpendicular), and displaying deep fissures, in some of which small streams descended, forming rather extensive patches of water at the bottom,

* Dr. Hooker remarks (*Lecture on Insular Floras*, p. 5)—"Of flowering plants, 350 species have been collected from the principal islands of the Azores. Of these," according to him, "thirty are peculiar species, or well-marked varieties, representatives for the most part of Madeiran or European plants. About thirty are Atlantic types, common to the Azores and Madeira, or to the Azores and the Canaries, or to all; the rest are Portuguese or Spanish plants." And he further observes that, "though so much farther north than Madeira, the Azores contain scarcely any more boreal plants than Madeira, or even than the Canaries; and such as it does possess are likewise found in the mountains of the Spanish Peninsula."

which is almost quite flat, only exhibiting a few isolatad knolls, and towards one side a small cone of about thirty feet in height, in the centre of which is a miniature crater, very deep in proportion to its width.

The descent was of rather a fatiguing nature owing to its steepness. On my way down I obtained fine specimens of two species of ferns, one of which, the *Lastræa æmula*, is met with in Great Britain, while the other, a Dicksonia (*D. culcita*), occurs also at Madeira. I was much struck with the extremely handsome appearance presented by the fructifications of the latter. Near the bottom, growing in a damp nook at the edge of a stream, three other species occurred,—the common hart's tongue, *Scolopendrium vulgare*, an Asplenium (*A. monanthemum*), much like our British *A. trichomanes*, and the *Hymenophyllum Tunbridgense*. Another fern that occurred plentifully, near but not in the crater, was *Osmunda regalis*. After spending some time at the bottom, and visiting the small cone which was densely covered with low shrubs, we commenced the ascent of the steep wall, which we found a still more fatiguing task than the descent had been. Our largest donkey-boy, however, met us when we were about two-thirds of the way up, greeting us with shouts of "Come on, marinero," and relieved me of my heavily-loaded vasculum. Having gained the top, we mounted our donkeys and rode back to the town, stopping for a few minutes at an outlying village, where we had some detestable wine, and our attendants some bread and cheese. After our return to Horta, and we had dismissed our donkeys, we spent about an hour in the inspection of the streets. With the exception of groups of flowers ingeniously cut out of the pith of the fig-tree, but little was to be seen worth investing in to

serve as memorials of our visit to Fayal, and I was disappointed in not being able to obtain any good photographic views of this beautiful island. One circumstance specially noticed by us was the multitude of beggars in the streets. In entering a hotel to get some refreshments, we found the stairs literally lined with a row of whining wretches, from whose importunities it was not easy to escape. At five P.M. we returned to the vessel, and soon after we got under way, leaving Fayal behind us on a beautiful moonlight night.

Nine days later we entered the English Channel after an absence of nearly three years, and on the evening of the 30th of July anchored at Spithead. Here, therefore, my chronicle of our experiences ends, and I bid my reader farewell.

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ERRATA.

Page 16, line 20 from top of page.—*For* St. Antonio, *read* San Antonio.
,, 27, ,, 6 ,, ,, *For* set in the northern hemisphere, *read* set in the northern hemisphere for the last time.
,, 64, ,, 22 ,, ,, *For* pale mild, *read* wild pale.
,, 83, ,, 10 ,, ,, *For* Valdiviva, *read* Valdivia.
,, 107, ,, 2 ,, ,, *For* over the greater part, *read* throughout the greater part.
,, 176, ,, 23 ,, ,, *For* modification, *read* nidification.
,, 185, ,, 19 ,, ,, For *C. digitata*, read *sagittata*.

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